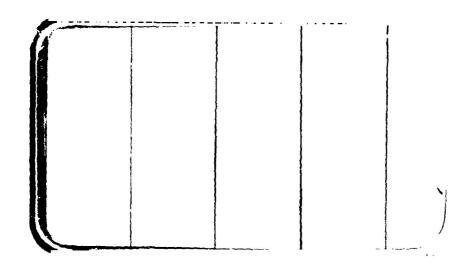


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(NASA-CR-141802) RESULTS OF AERCTHEFMODYNAMIC HEATING TESTS ON A 0.013-SCALE MODEL SCLID FOCKET BOOSTEF IN THE NASA/LARC UNITARY PLAN WIND TUNNEL (SH12F) (Chrysler Corf.) 224 p HC \$7.25 N75-30246

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SPACE SHUTTLE

AEROTHERMODYNAMIC DATA REPORT

JOHNSON SPACE CENTER

HOUSTON, TEXAS

**DATA MAN**agement services



# DMS-DR-2216 NASA CR-141,802

RESULTS OF AEROTHERMODYNAMIC HEATING TESTS

ON A 0.013-SCALE MODEL SOLID ROCKET BOOSTER IN

THE NASA/Larc UNITARY PLAN WIND TUNNEL

(SH12F)

by

Edwin B. Brewer Thermal Environment Branch Marshall Space Flight Center

Prepared under NASA Contract Number NAS9-13247

by

Data Management Services Chrysler Corporation Space Division New Orleans, La. 70189

for

**Engineering Analysis Division** 

Johnson Space Center National Aeronautics and Space Administration Houston, Texas

## WIND TUNNEL TEST SPECIFICS:

NASA/LaRC UPWT 1115 Test Number:

NASA Series Number: SH12F

July 29 - August 7, 1974 Test Dates:

Occupancy Hours:

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Chrysler Corporation Space Division assumes no responsibility for the data presented other than display characteristics.

# RESULTS OF AEROTHERMODYNAMIC HEATING TESTS ON A 0.013 SCALE MODEL SOLID ROCKET BOOSTER IN THE NASA/LARC UNITARY PLAN WIND TUNNEL

(SH12F)

by

#### Edwin B. Brewer, NASA/MSFC

#### **ABSTRACT**

A 0.013 scale model of the Solid Rocket Booster (SRB) used to launch the Space Shuttle has been tested in the NASA/LaRC Unitary Plan Wind Tunnel at a Mach number of 3.7 and Reynolds numbers of 1.5 and 3.5 x 10<sup>6</sup> per foot. The objective of the test was to obtain aerodynamic heat transfer data on the surface of scaled models of the SRB at simulated full scale reentry flight conditions. Three separate models were utilized to measure film coefficients over an angle of attack range from 0° to 180° at 0° sideslip. All three models were representations of the MCRO200 baseline configuration and varied only by the way they were mounted in the tunnel. Model A (denoted 1.0 on the plots), sting mounted thru the model base, was utilized for testing between 0° and 40° angle of attack. Model B (2.0) was blade mounted from the top of the model and was tested between 60° and 120° angle of attack. Model C (3.0) was sting mounted thru the model nose and utilized for testing between 140° and 180° angle of attack.

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TANEX OF DATA FIGURES	TITLE	H/HREF ALONG TOP AND BOTTOM CENTERLINE (WITH BOUNDRY LAYER TRIP)	H/HREF ALONG TOP AND BOTTOM CENTERLINE (W/O BNDRY LAYER TRIP, RN/L = 1.5)	H/HREF ALONG TOP AND BOTTOM CENTERLINE (W/O BNDRY LAYER TRIP, RN/L = 3.5)	H/HREF ALONG TOP AND BOTTOM CENTERLINE (W/O BNDRY LAYER TRIP AND RING)	H/HREF RADIALLY AT VARIOUS X/L STATIONS (WITH BOUNDRY LAYER TRIP)	H/HREF RADIALLY AT VARIOUS X/L STATIONS (W/O BNDRY LAYER TRIP, RN/L = 1.5,	HAHREF RADIALLY AT VARIOUS X/L STATIONS (W/O BNDRY LAYER TRIP, RN/L = 3.5)	H/HREF RADIALLY AT VARIOUS X/L STATIONS (W/O BNDRY LAYER TRIP AND RING)
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SCHEDULE OF COEFFICIENTS PLOTTED:

(A) H/HREF versus X/L (B) H/HREF versus THETA

# NOMENCLATURE

SYMBOL	PLOT SYMBOL	DEFINITION
α	ALPHA	angle of attack, degrees
β	BETA	angle of sideslip, degrees
b		skin thickness, ft.
С		specific heat of skin material, BTU/LB °R
$c_{\mathbf{p}}$		specific heat of air at constant pressure
h	н	heat transfer coefficient, BTU/FT <sup>2</sup>
ho		heat transfer coefficient based on free-stream conditions
h <sub>ref</sub>	HREF	stagnation point heat transfer coefficient for reference sphere
h/h <sub>ref</sub>	H/HREF	ratio of model heat transfer coefficient to heat transfer coefficient of reference sphere
Ho	PO	free-stream tunnel stagnation pressure, psf
k		heat conductivity of skin, BTU/FT-SEC-°R
M <sub>oo</sub>	MACH	free-stream Mach number
Mode1	MODEL	model number as follows 1 - Model A, aft sting mount 2 - Model B, center sting mount 3 - Model C, forward sting mount
NSto		Stanton number based on free-stream conditions
Pt,1		free-stream stagnation pressure, psf
P <sub>t,2</sub>		stagnation pressure behind normal shock
ġ		heal transfer rate
R		gas constant

# NOMENCLATURE (Concluded)

SYMBOL	PLOT SYMBOL	DEFINITION
R <sub>N</sub>	RN/L	free-stream Reynolds number per foot
t		time, sec.
τ <sub>o</sub>	TO	stagnation temperature, °R
т <sub>е</sub>		equilibrium temperature, °R
Υ <sub>e,l</sub>		equilibrium temperature measured prior to heat bump, ${}^{\circ}R$
T <sub>w</sub>		model wall temperature, °R
Tw,o		initial wall temperature, °R
T <sub>w,t</sub>		wall temperature at time t, °R
θ	THETA	radial position measured counterclockwise looking forward, O degrees at top centerline
٧ <sub>∞</sub>		free-stream velocity, ft/sec
W		W x b, 1b/ft <sup>2</sup>
W		skin weight, lb/ft <sup>3</sup>
X/L	X/L	longitudinal location, fraction of body length
$\rho_{\infty}$		free-stream density
ρ <sub>W</sub>		dencity along model wall
<sup>p</sup> t,2		stagnation density behind normal shock
<sup>μ</sup> o		viscosity based on stagnation temperature
$\mu_{f W}$		viscosity along model wall
<sup>μ</sup> t,2		stagnacion viscosity behind normal shock

#### CONFIGURATIONS INVESTIGATED

These tests utilized three separate 0.013 scale model representation of the MCR0200 baseline configuration to cover the test angle of attack range of 0° to 180°. The three models differed only in their tunnel support modification.

Model A, sting mounted thru the model base, was designed to be tested from  $\alpha = 0^{\circ}$  to  $40^{\circ}$ . Figure 2(a) shows the model and the thermocouple locations. During the test, five thermocouples on this model were inoperative: 1, 2, 17, 47, and 79. These have been circled in the Figure and in Table I, which supplements Figure 2(a) concerning thermocouple locations.

A Model A installation photograph appears in Figure 3(a). Model A was tested with and without the aft attach ring. The ring may be seen in the figure. Model A was also tested with and without a boundary layer trip of number 35 grit located on the nose of the SRB.

Testing the angle-of-attack range of 0° to 40° for Model A was accomplished by rotating the sting from  $\alpha$  = 0° to 15° during testing, shutting down the tunnel, changing the sting adapter to set a 30° bias on the sting position, and then testing from  $\alpha$  = 30° to 40°. A similar procedure was used on Models B and C.

Model B, blade mounted from the model top center, was designed to be tested from  $\alpha=60^\circ$  to  $120^\circ$ . Inoperative thermocouples are circled on Figure 2(b) and in Table II (4, 52, 59, and 79). Numbers 71 and 72, although wired in reverse, were operative. Model B installation photographs appear in Figures 3(b) and 3(c). Figure 3(c) shows Model B with three

## CONFIGURATIONS INVESTIGATED (Concluded)

protuberances installed. During the first tunnel warmup run, the two forward protuberances blew off the model due to adhesive failure.

The aft protuberance simulates the stage separation motors. This protuberance was on Model B for runs 34 through 41.

Model C, sting mounted thru the model nose, was designed to be tested from  $\alpha = 140^{\circ}$  to  $180^{\circ}$ . Two pairs of reversed thermocouples were discovered; 17 with 18 and 109 with 98. These are marked on Figure 2(c) and in Table III. Model C is shown installed in the test section in Figure 3(d).

Table IV summarizes the tests by collating the configuration tested with the specific tunnel run number. It also gives the other salient test parameters.

The models are of thin skin design. Taole V lists the physical constants for the model material which was 17-4 PH H900 stainless steel.

### TEST FACILITY DESCRIPTION

The Langley Research Center Unitary Plan Wind Tunnel is an air-medium continuous-flow facility consisting of two test sections. Asymmetrical sliding-block type throats control Mach number, and models con be supported from stings mounted to the side-wall strut-systems. Each test section is 4 feet by 4 feet. Section Number 1 operates at M = 1.47 to M = 2.86 and Section Number 2 operates at M = 2.29 to M = 4.63.

Reynolds numbers and tunnel pressures are variable, with limitations prescribed by tunnel capabilities and model load designs. Normal operating total temperature is 150°F.

## DATA REDUCTION

The basic heat balance equation is

when neglecting losses, the equation can be written

$$h(T_e - T_w) = Wbc \frac{dT_w}{dt}$$

and by rearranging

$$\frac{T_e}{T_o} \int_0^t T_o dt - \int_0^t T_w dt = \frac{wc}{h} \int_{T_{w,0}}^{T_w,t} dT_w$$

where  $T_{e}/T_{0}$  is experimentally determined. Thus

$$h = \frac{wc (T_{w,t} - T_{w,0})}{\frac{T_e}{T_0} \sum_{i=0}^{t} T_{i} \Delta t - \sum_{i=0}^{t} T_{i} \Delta t}$$

or when considering the losses due to conduction

$$h = \frac{wc}{\frac{T_e}{T_o}} \frac{t}{s} \frac{T_o}{s} \frac{\Delta t}{s} - \frac{kb}{s} \frac{\frac{t}{s}}{s} \nabla^2 T_w}{\frac{T_o}{s} \frac{t}{s} \frac{T_o}{s} \Delta t}$$

where

$$\nabla^2 T_{W} = \frac{\delta^2 T_{W}}{\delta X^2} + \frac{\delta^2 T_{W}}{\delta Y^2}$$

and

$$\frac{\delta^{2}T_{W}}{\delta X^{2}} = \begin{cases} \frac{T_{n+1} - \left(T_{e,1}\right)_{n+1} - \left(T_{n} - \left(T_{e,1}\right)_{n}\right)}{X_{n+1} - X_{n}} \\ -\frac{T_{n} - \left(T_{e,1}\right)_{n} - \left(T_{n-1} - \left(T_{n}\right)_{n-1}\right)}{X_{n} - X_{n-1}} \end{cases} \frac{2}{X_{n+1} - X_{n-1}}$$

## DATA REDUCTION (Continued)

and

$$\frac{\delta^{2}T_{W}}{\delta^{\gamma^{2}}} = \left\{ \frac{T_{n+1} - \left(T_{e,1}\right)_{n+1} - \left[T_{n} - \left(T_{e,1}\right)_{n}\right]}{Y_{n+1} - Y_{n}} - \frac{T_{n} - \left(T_{e,1}\right)_{n} - \left[T_{n-1} - \left(T_{e,1}\right)_{n-1}\right]}{Y_{n} - Y_{n-1}} \right\} \frac{2}{Y_{n+1} - Y_{n-1}}$$

Symbols

 $W = skin weight (1b/ft^3)$ 

 $w = W \times b (1b/ft^2)$ 

b = skin thickness (ft)

c = specific heat of skin material, BTU/1b°R

k = heat conductivity of skin BTU/ft-sec-°R

h = heat transfer coefficient  $BTU/ft^2$ 

q = aerodynamic heat input

Te,1 = equilibrium temperature measured prior to heat bump, °R

To = stagnation temperature, °R

Tw = model wall temperature, °R

X,Y = thermocouple coordinates

#### Subscripts

0 = time zero unless defined otherwise

t = time greater than zero

n = pertaining to thermocouple location

# DATA REDUCTION (Continued)

# EQUATION FOR COMPUTING REFERENCE STAGNATION POINT HEATING RATE

The stagnation point heating rate on a sphere can be determined from the following equation from Reference 1.

$$\dot{q}_{0} = 0.94(\rho_{W}\mu_{W})^{0.5} \left[ \frac{\rho_{t,2} \mu_{t,2}}{\rho_{W} \mu_{W}} \right]^{0.4} (H_{0} - H_{W}) \left\{ \left( \frac{1}{r} \right)^{0.5} \left[ 2RT_{0} \left( 1 - \frac{P_{\infty}}{\rho_{t,2}} \right) \right]^{0.25} \right\}$$
(2-1)

For the range of stagnation temperature and wall temperature of the present tests

$$H_0 - H_w \approx C_D (T_0 - T_w) \tag{2-2}$$

and by definition

$$N_{St_0} = \frac{q_0}{\rho_{\infty} V_{\infty} C_D (T_0 - T_w)}$$
 (2-3)

Substituting Eqs. 2-2 and 2-3 into Eq. 2-1 and rearranging results in

$$N_{St_0} = \frac{1.118}{\rho_{\infty} V_{\infty}} \frac{\left(\mu_0\right) 0.5}{\left(RT_0\right) 0.25} \left(\frac{1}{r}\right)^{0.5} \left(\frac{P_{t,2}}{P_{t,1}}\right)^{0.5} \left(P_{t,1}\right)^{0.5}$$
 (2-4)

Aiso by definition

$$NSt_0 = \frac{h_0}{\rho_\infty V_\infty C_0}$$
 (2-5)

therefore

$$h_0 = 1.118 C_p \frac{(\mu_0)^{0.5}}{(RT_0)^{0.5}} (\frac{1}{r})^{0.5} (\frac{P_{t,2}}{P_{t,1}})^{0.5} (P_{t,1})^{0.5}$$
 (2-6)

## DATA REDUCTION (Concluded)

#### where:

 $C_p$  = specific heat of air at constant pressure

 $h_0$  = heat transfer coefficient based on free-stream conditions

 $NSt_0$  = Stanton number based on free-stream conditions

 $\rho_{\infty}$  = free-stream density

 $V_{\infty}$  = free-stream velocity

 $\mu_0$  = viscosity based on stagnation temperature

T<sub>0</sub> = stagnation temperature

R = gas constant

r = nose radius = 0.130 feet

 $P_{t,2}$  = stagnation pressure behind normal shock

 $P_{t-1}$  = free-stream stagnation pressure

The data presented herein are in ratio form H/HREF where HREF is the calculated stagnation heat transfer coefficient on a 0.013 ft. sphere (1 ft. sphere at .013 model scale).

#### **CATA PRESENTATION**

Schlieren photographs of all three models along with an identification of test conditions are contained in Appendix A. The Schlieren photographs were taken after the heat transfer tests were completed. Many of the photographs are of repeated test conditions at two model translated locations. This was done to view the flow obscured by the vertical bars on the wind-tunnel window. For example, compare the photograph for point 68 to photograph for point 69. Both are of the same configuration, Reynolds number, angle of attack, and stagnation pressure; only the sting has been translated upstream for point 69.

Tabulated data from the tests are presented in Appendix B.

# REFERENCE

Fay, J. A. and Riddell, F. R., "Theory of Stagnation Point Heat Transfer in Dissociated Air", Journal of Aeronautical Sciences, February 1958.

Table I. THERMOCOUPLE LOCATION FOR MODEL A

Station Number	Thermocouple Number	X (inches)	X/L	θ <u>(deg)</u>
1	$\mathbf{\Psi}$	0.600	0.0265	0
1	Q	0.600	0.0265	90.0
1	3	0.600	0.0265	180.0
2	4	1.120	U.0495	0
2	5	1.120	0.0495	45.0
2	6	1.120	0.0495	90.0
2	7	1.120	0.0495	135.0
2 2 3 3 3 3 3 3 3	8	1.120	0.0495	180.0
3	9	2.200	0.0972	0
3	10	2.200	0.0972	22.5
3	11	2.200	0.0972	45.0
3	12	2.200	0.0972	67.5
3	13	2.200	0.0972	90.0
3	14	2.200	0.0972	112.5
. 3	15	2.200	0.0972	135.0
3	16	2.200	0.0972	157.5
	Q	2.200	0.0972	180.0
4	18 19	2.700	0.1193	0
4		2.700	0.1193	45.0
4	20	2.700	0.1193	90.0
4	21	2.700	0.1193	135.0
4	22	2.700	0.1193	180.0
5 5 จ์	23 24	2.950	0.1303 0.1303	0
<b>5</b>	24 25	2.950		180.0 0
		4.050	0.1789	180.0
6	26 27	4.050 4.300	0.1789 0.1900	0
7 7	28	4.300	0.1900	22.5
	29	4.300	0.1900	45.0
7 7	30	4.300	0.1900	67.5
7	31	4.300	0.1900	90.0
7	32	4.300	0.1900	112.5
7	33	4.300	0.1900	135.0
7	34	4.300	0.1900	157.5
7	35	4.300	0.1900	180.0
8	36	4.550	0.2010	0
8	30 37	4.550	0.2010	180.0
9	38	7.550	0.3336	0
9	39	7.550	0.3336	180.0
10	40	7.800	0.3446	0
10	41	7.800	0.3446	45.0
10	42	7.800	0.3446	90.0
10	43	7.800	0.3446	135.0
10	44	7.800	0.3446	180.0
	• •			

Note: Model Drawing No. 80M51354

Table I. THERMOCOUPLE LOCATION FOR MODEL A (Continued)

Station Number	Thermocouple Number	X <u>(inches)</u>	X/L	θ <u>(deg)</u>
11	45	8.050	0.3557	0
11	46	8.050	0.3557	180.0
12	Ø	9.520	0.4206	0
12	48	9.520	0.4206	180.0
13	49	9.770	0.4317	0
13	50	9.770	0.4317	22.5
13	51	9.770	0.4317	45.0
13	52	9.770	0.4317	67.5
13	53	9.770	0.4317	90.0
13	54	9.770	0.4317	112.5
13	55	9.770	0.4317	135.0
13	56	9.770	0.4317	157.5
13	57	9.770	0.4317	180.0
14	58	10.020	0.4427	0
14	59	10.020	0.4427	180.0
15	60	12.000	0.5302	0
15	61	12.000	0.5302	180.0
16	62	12.250	0.5412	0
16	63	12.250	0.5412	22.5
16	64	12.250	0.5412	45.0
16	65	12.250	0.5412	67.5
16	66	12.250	0.5412	90.0
16	67	12.250	0.5412	112.5
16	68	12.250	0.5412	135.0
16	69	12.250	0,5412	157.5
16	70	12.250	0.5412	180.0
17	71	12.500	0.5523	0
17	72	12.500	0.5523	180.0
18	73	16.400	0.7246	0
18	74	16.400	0.7246	180.0
19	<b>7</b> 5	16.650	0.7357	0
19	76	16.650	0.7357	180.0
20	77	16.900	0.7467	0
20	78	16.900	0.7467	45.0
20	<b>(9</b>	16.900	0.7467	90.0
20	80	16.900	0.7467	135.0
20	81	16.900	0.7467	180.0
21	82	17.350	0.7666	0
21	83	17.350	0.7666	45.0
21	84	17.350	0.7666	90.0
21	85	17.350	0.7666	135.0
21	86	17.350	0.7666	0.081
22	87	17.600	0.7776	0
22	88	17.600	0.7776	180.0

Table I. THERMOCOUPLE LOCATION FOR MODEL A (Concluded)

Station	Thermocouple	X (taches)	<b>9</b> /1	0
Number	Number	(irches)	X/L	(deg)
23	89	19.250	0.8505	0
23	90	19.250	0.8505	180.0
24	91	19.500	0.8616	0
24	92	19.500	0.8616	180.0
25	93	19.750	0.8726	0
25	94	19.750	0.8726	180.0
26	95	20.000	0.8837	0
26	96	20.000	0.8837	180.0
27	97	20.250	0.8947	0
27	98	20.250	9.8 <del>94</del> 7	45.0
27	99	20.250	0.8947	90.0
27	100	20.250	0.8947	135.0
27	101	20.250	0.8947	180.0
28	102	20.500	0.9058	0
28	103	20.500	0.9058	180.0
29	104	21.000	0.9278	0
29	105	21,000	0.9278	45.0
29	106	21.000	0.9278	90.0
29	107	21.000	0.9278	135.0
29	108	21.000	0.9278	180.0
30	109	21.500	0.9499	0
30	110	21.500	0.9499	22.5
30	111	21.500	0.9499	45.0
30	112	21.500	0.9499	67.5
30	113	21.500	0.9499	90.0
30	114	21.500	0.9499	112.5
30	115	21.500	0.9499	135.0
30	116	21.500	0.9499	157.5
30	117	21.500	0.9499	180.0

Table II. THERMOCOUPLE LOCATION FOR MODEL B

Station Number	The rmocouple Number	X <u>(inches)</u>	X/L	θ <u>(deg)</u>
		1234		75587
1	1	0.600	0.0265	0
1	2	0.600	0.0265	90.0
1	3	0.600	0.0265	180.0
2	3 4 5 6 7	1.120	0.0495	0
2	5	1.120	0.0495	45.0
2	6	1.120	0.0495	90.0
2	7	1.120	C.0495	135.0
2	8	1.120	0.0495	180.0
3	9	2.200	0.0972	0
3	10	2.200	0.0972	22.5
3	11	2.200	0.0972	45.0
3	12	2.200	0.0972	67.5
3	13	2.200	0.0972	90.0
3	14	2.200	0.0972	112.5
3	15	2.200	0.0972	135.0
3	16	2.200	0.0972	157.5
3	17	2.200	0.0972	180.0
4	18	2.700	0.1193	0
4	19	2.700	0.11 <b>9</b> 3	45.0
4	20	2.700	0.1193	90.0
4	21	2.700	0.1193	135.0
4	22	2.700	0.1193	180.0
5	23	2.950	0.1303	0
5	24	2.950	0.1303	180.0
6	25	4.050	0.1789	0
6	26	4.050	0.1789	180.0
7	27	4.300	0.1900	0
7	28	4.300	0.1900	22.5
7	29	4,300	0.19 <b>0</b> 0	45.0
7	30	4.300	0.1900	67.5
7	31	4.300	0.1900	90.0
7	32	4.300	0.1900	112.5
7	33	4.300	0.1900	135.0
7	34	4.30C	0.1900	157.5
7	35	4.300	0.1900	180.0
8	36	4.550	0.2010	0
8	37	4.550	0.2010	180.0
9	38	7.550	0.3336	0
9	39	7.550	0.3336	180.0

Note: Model Drawing No. 80M51355

Table II. THERMOCOUPLE LOCATION FOR MODEL B (Continued)

Station	Thermocouple	x		θ .
Number	Number	(inches)	<u> X/L</u>	(deg)
10	40	7.800	0.3446	0
10	41	7.800	0.3446	22.5
10	42	7.800	0.3446	45.0
10	43	7.800	0.3446	67.5
10	44	7.800	0.3446	90.0
10	45	7.806	0.3446	112.5
10	46	7.800	0.3446	135.0
10	47	7.800	0.3446	157.5
10	48	7.800	0.3446	180.0
11	49	8.050	0.3557	0
11	50	8.050	0.3557	180.0
12	51	8.300	0.3667	0
12	<b>©</b>	8.300	0.3667	180.0
13	53	16,150	0.7136	0
13	54	16.150	0.7136	22.5
13	55	16.150	0.7136	45.0
13	56	16.150	9.7136	67.5
13	57	16.150	0.7136	90.0
13	58	16.150	0.7136	112.5
13	<b>69</b>	16.150	0.7136	135.0
13	60	16.150	0.7136	157.5
13	61	16.150	0.7136	180.0
14	62	16.400	0.7246	0
14	63	16.400	0.7246	180.0
15	64	16.650	0.7357	0
15	65	16.650	0.7357	180.0
16	66	16.900	0.7467	0
16	67	16.900	0.7467	45.0
16	68	16.900	0.7467	90.0
16	69	16.900	0.7467	135.0
16	70	16.900	0.7467	180.0
17	72	17.350	0.7666	0
17	71	17.350	0.7666	45.0
17	73	17.350	0.7666	90.0
17	74	17.350	0.7666	135.0
17	75 76	17.350	0.7666	180.0
18	76	17.600	0.7776	0
18	77	17.600	0.7776	180.0
19	78 <b>2</b>	19.250	0.8505	0
19	Ø	19.250	0.8505	180.0
20	80	19.500	0.8616	0
20	81	19.500	0.8616	180.0
21	82	19.750	0.8726	0
21	83	19.750	0.8726	180.0
22	84	20.000	0.8837	0
22	85	20,000	0.8837	180.0
23	86 9.7	20,250	0.8947	0 45 0
23	87	20.250	0.8947	45.0
23	88	20.250	0.8947	90.0
23	89	20.250	0.8947	135.0

Table II. THERMOCOUPLE LOCATION FOR MODEL B (Concluded)

Station	Thermocouple	x		θ
Number	Number	(inches)	X/L	(deg)
23	90	20.250	0.8947	180.0
24	91	20.500	0.9058	0
24	92	20.500	0.9058	180.0
25	93	21.000	0.9278	0
25	94	21.000	0.9278	45.0
25	<b>9</b> 5	21.000	0.9278	90.0
25	96	21.000	0.9278	135.0
25	97	21.000	0.9278	180.0
26	98	21.250	0.9389	0
26	99	21.250	0.9389	180.0
27	100	21.500	0.9499	0
27	101	21.500	0.9499	22.5
27	102	21.500	0.9499	45.0
27	103	21.500	0.9499	67.5
27	104	21.500	0.9499	90.0
27	105	21.500	0.9499	112.5
27	106	21.500	0.9499	135.0
27	107	21.500	0.9499	157.5
27	108	21.500	0.9499	180.0
28	109	21.994	0.9718	0
28	110	21.994	0.9718	45.0
28	111	21.994	0.3718	90.0
28	112	21.994	0.9718	135.0
28	113	21.994	0.9713	180.0
29	114	22.200	0.9809	0
29	115	22.200	0.9809	45.0
29	116	22,200	0.9809	90.0
29	117	22.200	0.9809	135.0
29	118	22,200	0.9809	180.0

Table III. THERMOCOUPLE LOCATION FOR MODEL C

Station Number	Thermocouple Number	X (inches)	<u>X/L</u>	θ (deg)
1	1	2.761	0.1220	0
1	2	2.761	0.1220	180.0
2	3	3.012	0.1331	0
2	4	3.012	0.1331	45.0
2	5	3.012	0.1331	90.0
2	6	3.012	0.1331	135.0
	7	3.012	0.1331	180.0
2 3	8	3.262	0.1441	0
3	9	3.262	0.1441	180.0
4	10	4.062	0.1795	0
4	11	4.062	0.1795	180.0
5	12	4.312	0.1905	0
5	13	<b>4.312</b>	0.1905	45.0
5	14	4.312	0.1905	90.0
5	15	4.312	0.1905	135.0
5	16	4.312	0.1905	180.0
6	18	4.562	0.2016	0
6	17	4.562	0.2016	180.0
7	19	7.462	0.3297	0
7	20	7.462	0.3297	180.0
8	21	7.712	0.3407	0
8	22	7.712	0.3407	45.0
8	23	7.712	0.3407	90.0
8	24	7.712	0.3407	135.0
8	25	7.712	0.3407	180.0
9	26	7.962	0.3518	0
9	27	7.962	0.3518	180.0
10	28	9.512	0.4263	0
10	29	9.512	0.4203	180.0
11	30	9.762	0.4203	0
11	31	9.762	0.4203	45.0
11	32	9.762	0.4203	90.0
11	33	9.762	0.4203	135.0
11	34	9.762	0.4203	180.0
12	35	10.012	0.4424	0
12	36	10.012	0.4424	180.0
13	37	12.002	0.5303	0
13	38	12.002	0.5303	180.0
14	39	12.252	0.5413	0
14	40	12.252	0.5413	22.5
14	41	12.252	0.5413	45 <b>.0</b>

Note: Model Drawing No. 80M51356

Table III. THERMOCOUPLE LOCATION FOR MODEL C (Continued)

Station	The mocouple	x		ť
Number	Number	(inches)	X/L	<u>(deg)</u>
14	42	12.252	0.5413	7.5
14	43	12.252	0.5413	90.0
14	44	12.252	0.5413	112,5
14	45	12.252	0.5413	135.0
14	46	12.252	0.5413	157.5
14	47	12.252	0.5413	180,0
15	48	12.502	0.5524	0
15	49	12,502	0.5524	180.e
16	50	16.412	0.7251	0
16	51	16.412	0.7251	22,5
16	52	16.412	0.7251	45,0
16	53	16.412	0.7251	67.5
16	54	16.412	0.7251	90.0
16	55	16.412	0.7251	112.5
16	56	16.412	0.7251	135.0
16	57	16.412	0.7251	157.5
16	58	16.412	0.7251	180.0
17	59	16.662	0.7362	0
17	60	16.662	0.7362	180.0
18	61	16.912	0.7472	0
18	62	16.912	0.7472	45.0
18	63	16.912	0.7472	90.0
18	64	16.912	0.7472	135.0
18	65	16.912	0.7472	180.0
19	66	17.352	0.7667	0
19	67	17.352	0.7667	45.0
19	68	17.352	0.7667	90.0
19	69	17.352	0.7667	135.0
19	70	17.352	0.7067	180.0
20	71	17.602	0.7777	U
20	72	17.602	0.7777	180.0
21	73	19.252	0.8506	0
21	74	19.252	0.8596	180.0
22	75	19.502	0.8617	0
22	76	19.502	0.8617	180.0
23	77	19.752	0.8727	0
23	78	19.752	9727	180.0
24	79	20.002	U.8838	0
24	80	20.002	0.8838	180.0
25	81	20.252	0.8948	0
25	82	20.252	C.8948	22.5
25	83	20.252	0.8948	45.0
25	84	20.252	0.8948	67.5
25	85	20.252	0.8948	90.0
25	86	20.252	0.8948	112.5
25	87	20.252	0.8948	135.0
25	88	20.252	0.8948	157.5
25	89	20.252	0.8948	180.0

Table III. THERMOCOUPLE LOCATION FOR MODEL C (Concluded)

Station Number	The rmocouple Number	X (inches)	<u>X.'</u> L.	( <u>ਰ</u> ਵਣ,
26	90	20.502	0.9058	0
26	91	20.502	0.9058	180.0
27	92	20.972	0.9266	0
27	93	20.972	0.9266	45.0
27	94	20.972	0.9266	90.0
27	95	20.972	0.9266	135.0
27	96	20.972	0.9266	180.0
28	97	21.222	0.9377	0
28	109	21.222	0.4377	180.0
29	99	21.472	n.9487	0
29	<b>700</b>	21.472	0.9487	22.5
29	101	21.472	0.9487	45.0
29	102	21.472	0.9487	67.5
29	103	21.472	0.9487	90.0
29	104	21.472	0.9487	112.5
29	105	21.472	0.9487	135.0
29	106	21.472	0.9487	157.5
29	107	21.472	0.9487	180.0
30	108	22.012	0.9726	0
30	98	22.012	0.9726	45.0
30	110	22.012	0.9726	90.0
30	111	22.012	0.9726	135.0
30	112	22.012	0.9726	180.0
31	113	22.202	0.9810	n
31	114	22.202	0.9810	22.5
3.	115	22.202	0.9810	45.0
31	116	22.202	0.9810	67.5
31	117	22.202	0.9810	90.0
31	118	22.202	0.9810	112.5
31	119	22.202	0.9810	135.0
31	120	22.202	0.9810	157.5
31	121	22.202	0.9810	180.0

SER   11/10  74				1	TABLE IV.						1			ſ
SRB w/7R/P  SRB w/R/R/P  SRB w/R/R/R/P  SRB w/R/R/P  SRB w/R/R/P  SRB w/R/R/P  SRB w/R/R/P  SRB w/R/R/P  SRB w/R/R/P  S	TEST: UP) T 1115 (SH12F)	DAT	A SET	RUN HL	IMBER (	COLLATIO	M SUMM	ARY		ATE:	i	10/24		
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SRB wo/7:15	SRE NO/TRIPYRING			F						۲.	25%	1.4.		
SRB wo//7=1/F   1.5		<b>→</b>					-			26				
11	SRB	11.5					5	9	7	63		13		
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7 13 19 25 31 37 43 49 55 61 67 7 COEFFICENTS				-	<del> </del>	-	-						-	EST
7 13 19 25 31 37 43 49 55 61 67 72 12 13 19 25 31 37 43 49 55 61 67 73 13 15 15 15 15 15 15 15 15 15 15 15 15 15		+		-		-						-		Rui
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7 13 19 25 31 37 43 49 55 61 67 7 2 COEFFICENTS IDVAR(1) IDVAR(1) IDVAR(2) '			+	+	1	+	-+					+-		ΙМВ
7 13 19 25 31 37 43 49 55 61 67 7 20 EFFICENTS														ERS
7 13 19 25 31 37 43 49 55 61 67 7 7 COEFFICENTS				<del></del>										5
7 13 19 25 31 37 43 49 55 61 67 7 COEFFICENTS														_
7 13 19 25 31 37 43 49 55 61 67 7 COEFFICENTS IDVAR(1) 10V/R(2) 7														
7 13 19 25 31 37 43 49 55 61 67 7 COEFFICENTS 19VAR(1) 10VAR(2) 1														
7 13 19 25 31 37 43 49 55 61 67 7 COEFFICENTS				-										- 1
7 13 19 25 31 37 43 49 55 61 67 7 COEFFICENTS 10vAR(1) 10vAR(2) 1				-										
7 13 19 25 31 37 43 49 55 61 67 7 1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.													4	
7 13 19 25 31 37 43 49 55 61 67 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1												-	4	4
COEFFICENTS IDVAR(I) IDVAR(I) IDVAR(I) IDVAR(I)		25		-	37	43	64		S.S.		91	67		75.76
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	T	_						TE	ST	RUN	NU	MBE	RS						ڏ آ	1	2 .	
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MMARY		152	2 46	2 43	8 64								+	+					69	4		
TABLE IV. (Continued)  DATA SET/RUN NUMBER COLLATION SUMMARY		09	45	42	63								+						43	ببيينا		1 (
TABLE IV. (Continued) I/RUN NUMBER COLLATM	-	SX										+						_		4444	NTS	
IV.	LUES NO	RUNS	-							-	+	+	+						37	1111	COEFFICENT	
TABLE ET/RUN	TERS/VA	W/Z MODEL	7	F	<b>→</b>					-									31	111	ŭ	
DATA S	à	$\alpha$	1-	71	3.5			_				+	+				-		25	, , , ,		
	SCHD.	W.	+	<u>ٺ</u>	<i>→</i>							+		_			+		19			
JEWT IIIS (SHIZE)		CONFIGURATION	SAR WIG / TRIP		<del>                                     </del>														13			
EST: JFWT		DENTIFIER C	-	-	- 0	<b>&gt;</b>												+	,			8 OR 8

TABLE IV. (Concluded)

TEST: UPWT 1115 (SH12F)		<b>.</b>	DATA SE	TA SET/RUN NUMBER COLLATION SUMMARY	UMBE	R COLL	ATION	SUMM,	ARY	ر د	DATE:	11/10/14	74	
	Š	SCHD.	PARAMET	RAMETERS/VALUES	ES NO.					ALPHA	Ā			
CONFIGURATION	Σ	8	RV/L	MODEC	RUNS	S		041	150	160	170	180		
SRB WO/TRIP	3.7	0	1.5	3				35	39		3/	32	_	
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		· 		C0E1	COEFFICENTS	15						IDVAR (1)	DVAR	4 (2) ADV

## TABLE V. MATERIAL PROPERTIES OF THIN SKIN MODELS

\* Note: The exact skin thickness at each thermocouple location was measured. The average skin thickness is 0.030 inch.

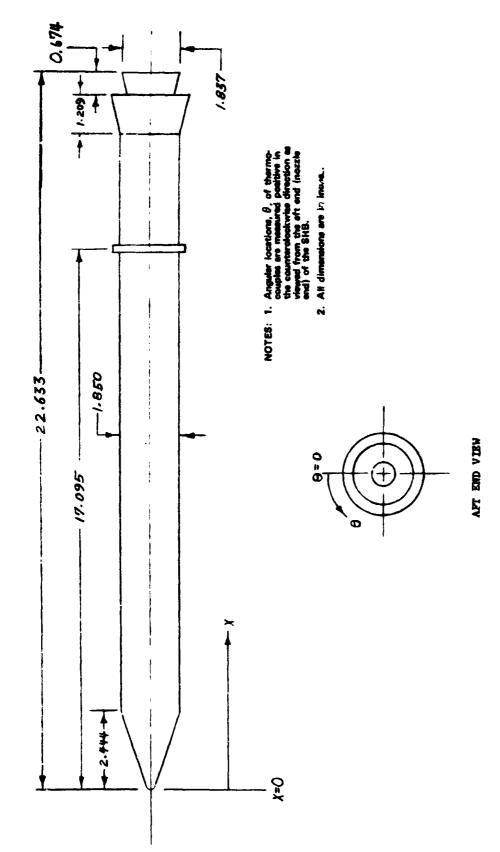
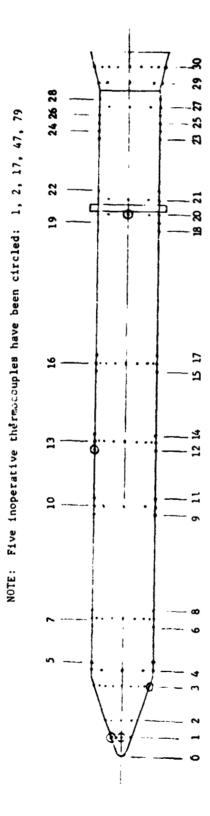


Figure 1. SCHEMATIC OF SRB WIND TUNNEL MODEL



These cross sections show thermocouple locations at the indicated stations looking forward (not to scale),

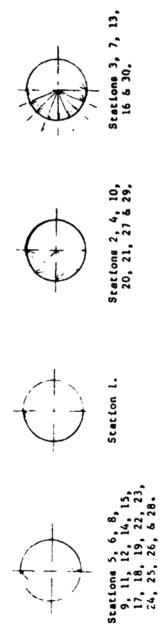
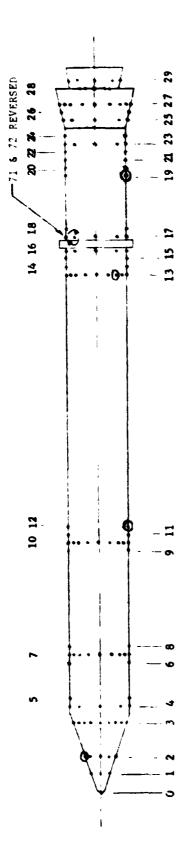


Figure 2(a). - SCHEMATIC OF MODEL A SHOWING THERMOCOUPLE LOCATIONS

NOTE: Four inoperative thermocouples have been circled: 4, 52, 59, 79



These cross sections show thermocouple locations at the indicated stations looking forward (not to scale).

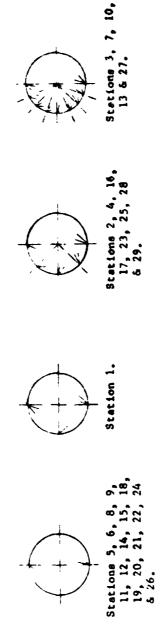


Figure 2(b). - SCHEMATIC OF MODEL B SHOWING THERMOCOUPLE LOCATIONS

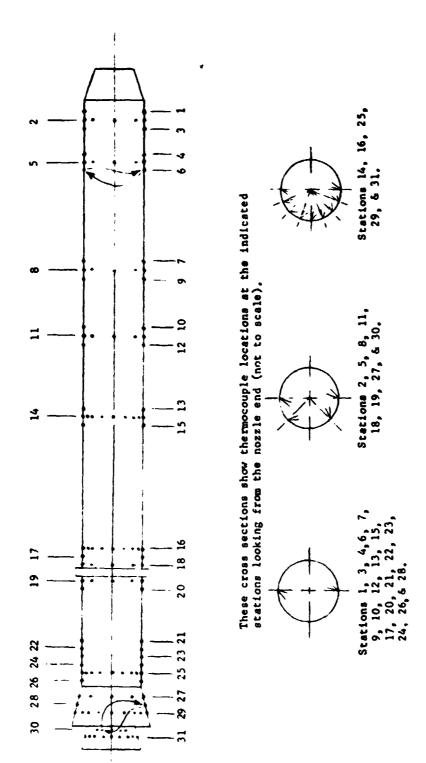


Figure 2(c).- SCHEMATIC OF MODEL C SHOWING THERMOCOUPLE LOCATIONS

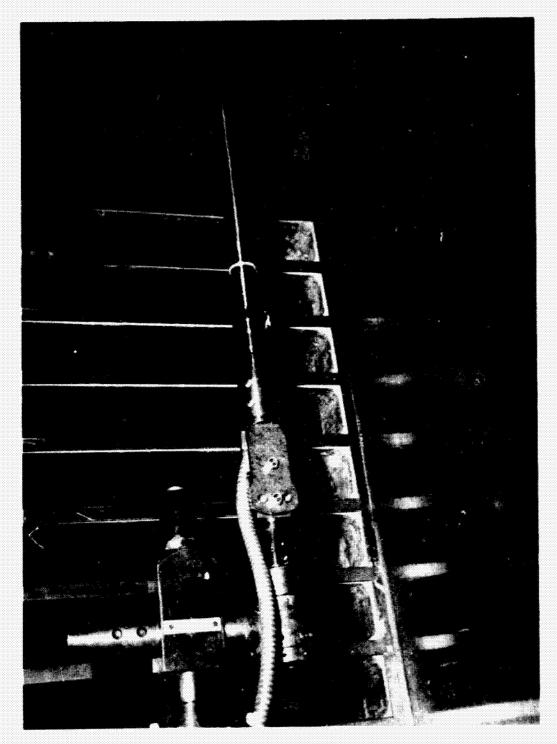
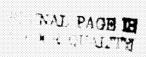


Figure 3(a). - MODEL A INSTALLED IN TEST SECTION



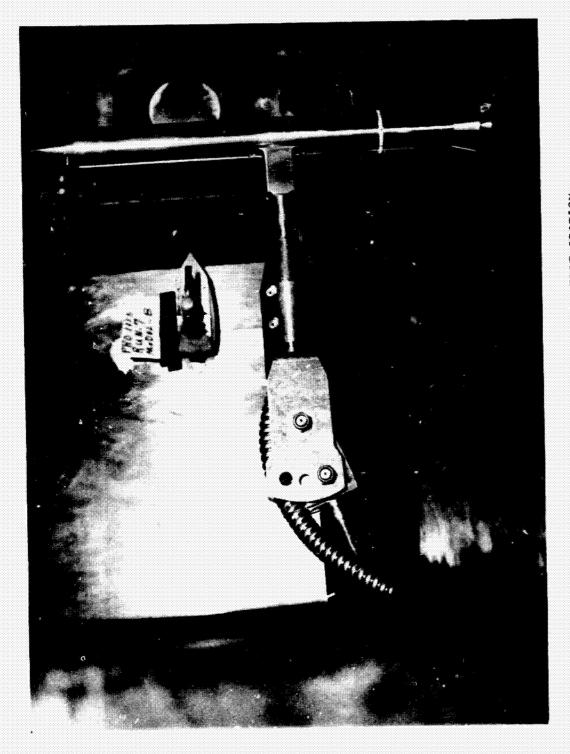


Figure 3(b). - MODEL B INSTALLED IN TEST SECTION

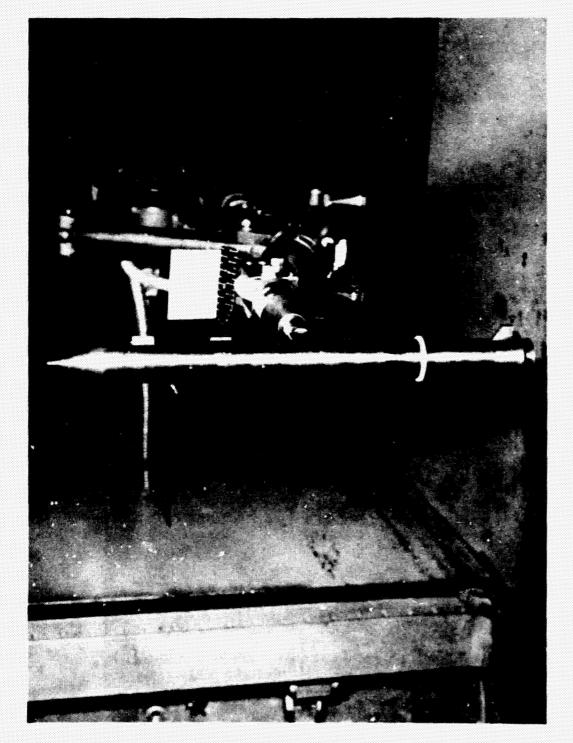


Figure 3(c). - MODEL B WITH PROTUBERANCES INSTALLED IN TEST SECTION

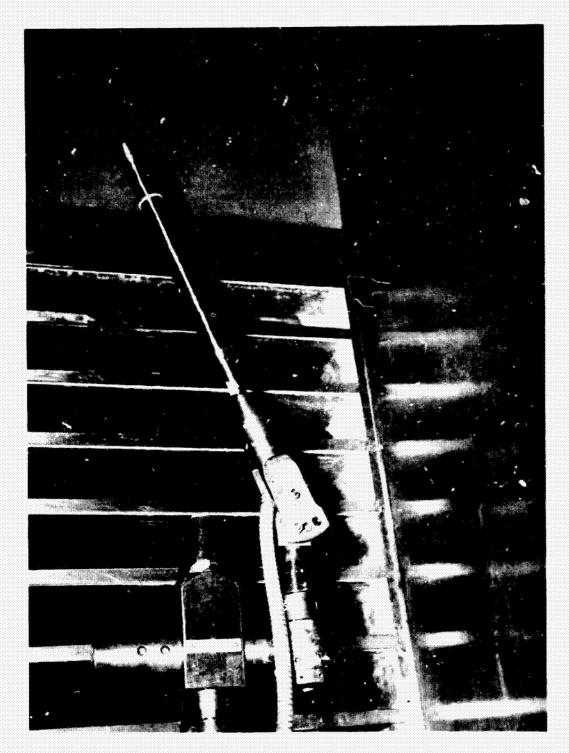


Figure 3(d). - MODEL C INSTALLED IN TEST SECTION

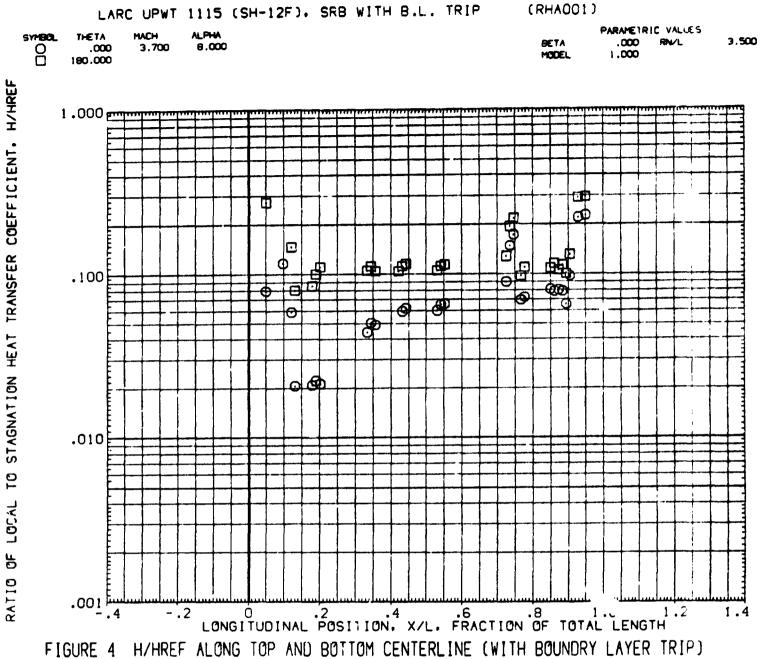
DATA FIGURES

LARC UPWT 1115 (SH-12F), SRB WITH B.L. TRIP (RHA001) SYMBOL PARAMETRIC VALUES 0 3.700 .000 .000 BETA .000 3.500 180.000 MODEL 1,000 H/HREF 1.000 program COEFFICIENT, STAGNATION HEAT TRANSFER .100 F-0 4 -3010. 5 RATIO OF LOCAL ·001 F LONGITUDINAL POSITION, X/L. FRACTION OF TOTAL LENGTH - .2

FIGURE 4 H/HPEF ALONG TUP AND BOTTOM CENTERLINE (WITH BOUNDRY LAYER TRIP)

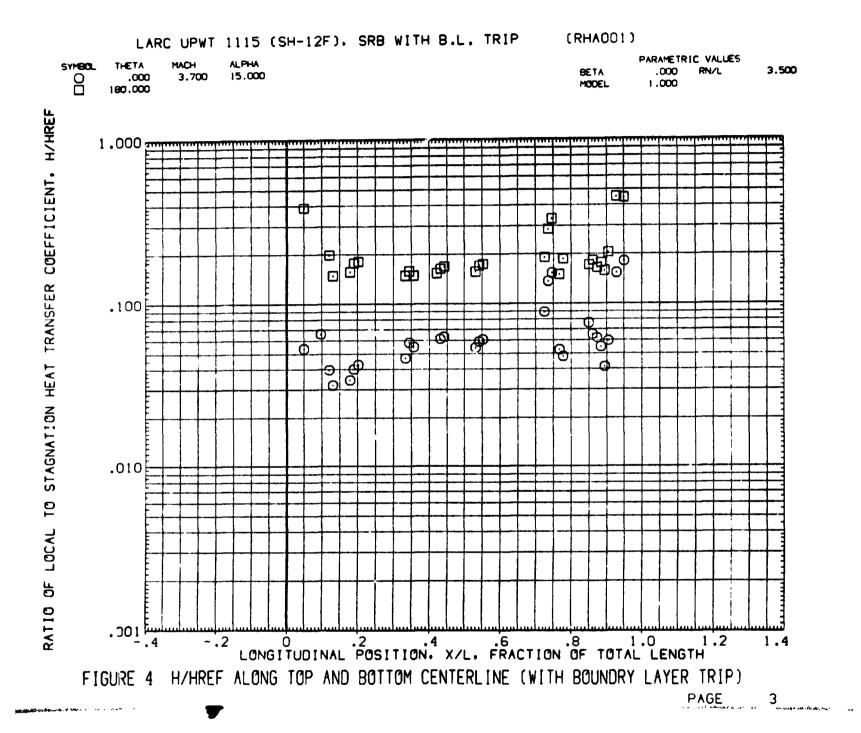
PAGE

1

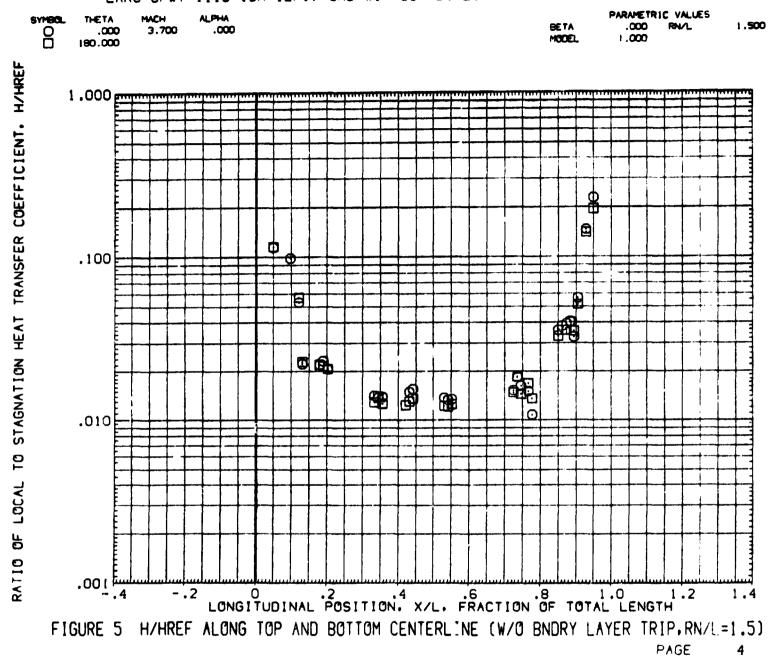


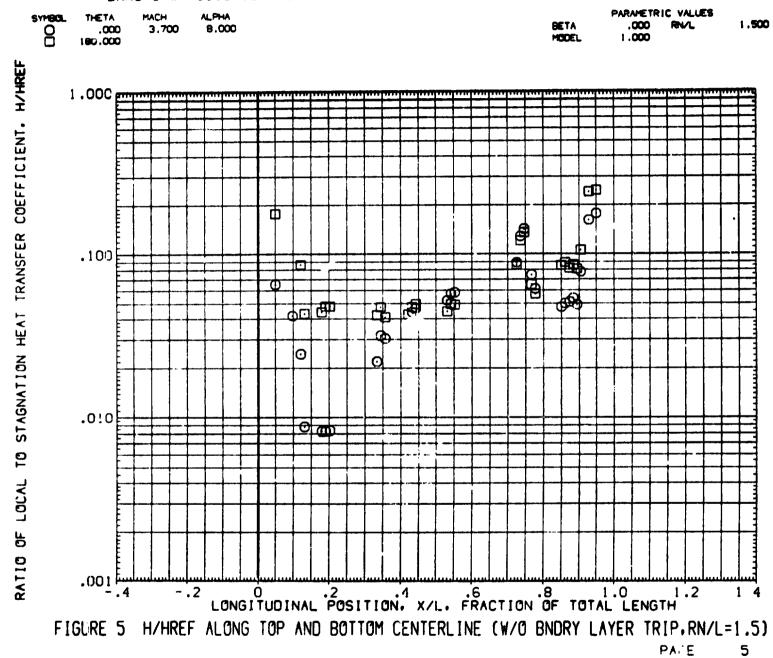
PAGE

2

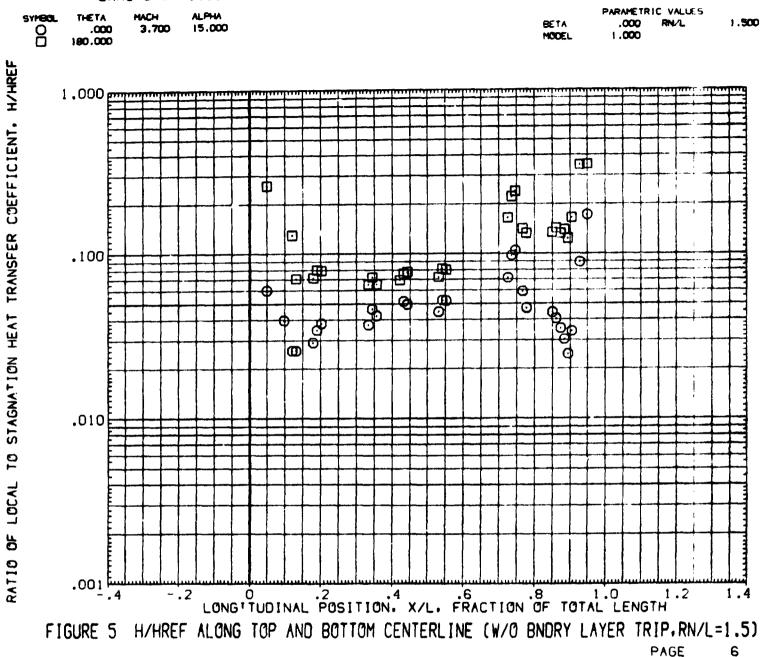


LARC UPWT 1115 (SH-12F), SRB WITHOUT B. L. TRIP (RHA004)

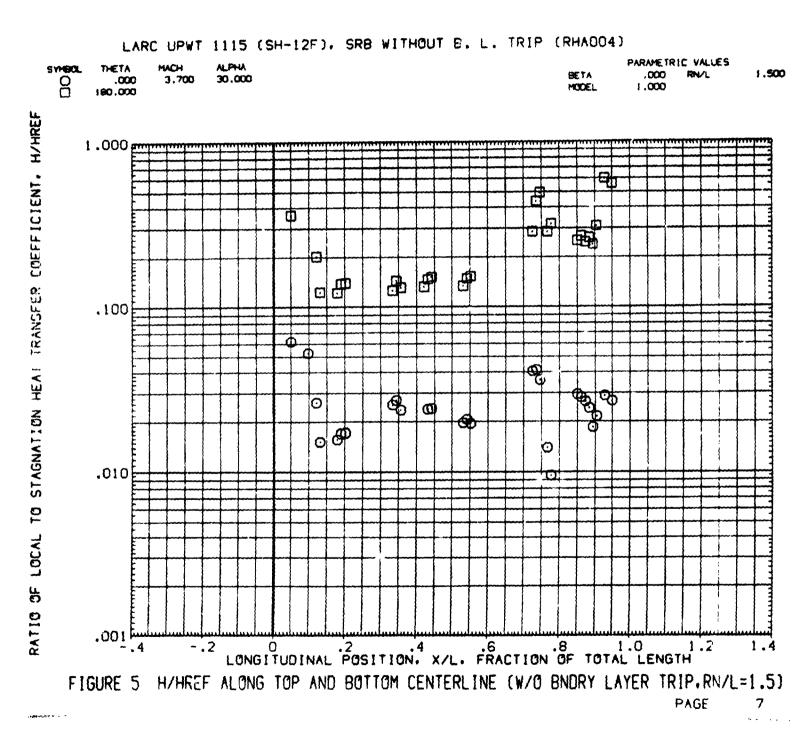


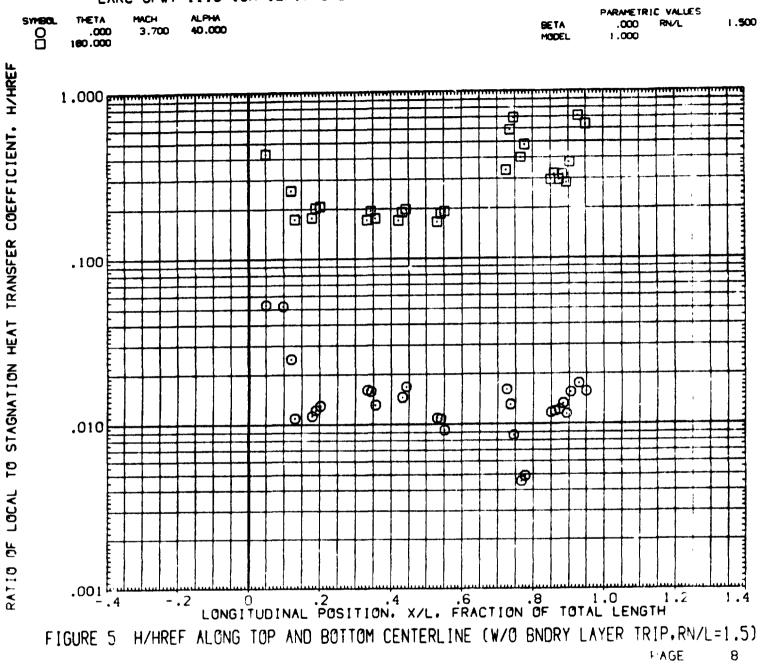


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LARC UPWT 1115 (SH-12F). SRB WITHOUT B. L. TRIP (RHA006)

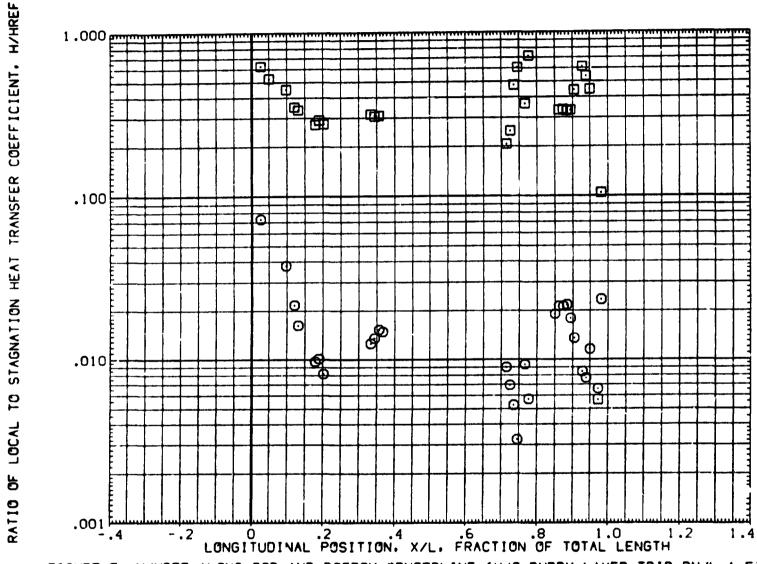
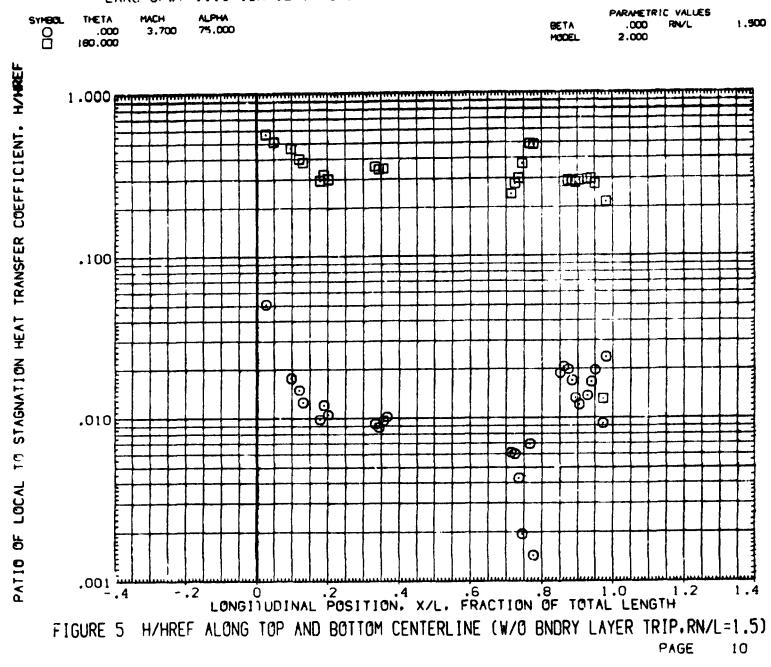
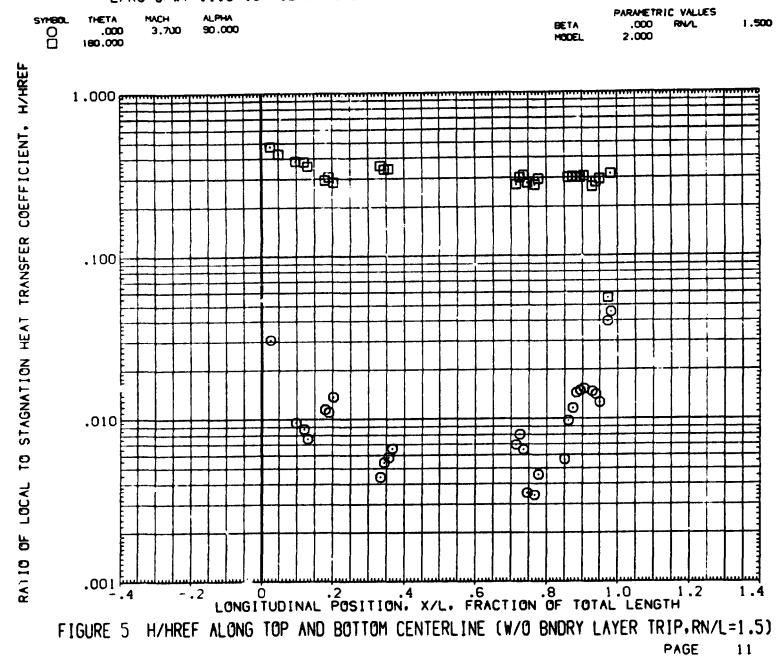


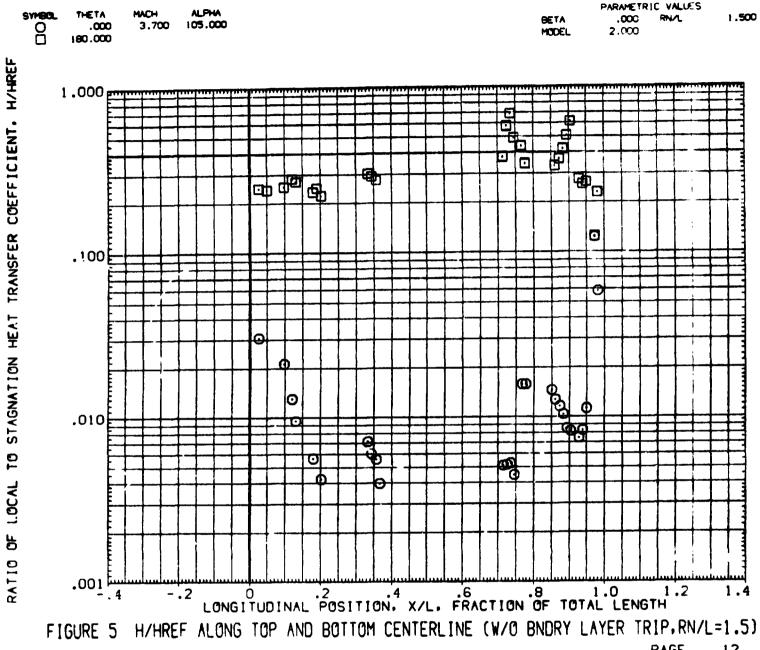
FIGURE 5 H/HREF ALONG TOP AND BOTTOM CENTERLINE (W/O BNDRY LAYER TRIP, RN/L=1.5)

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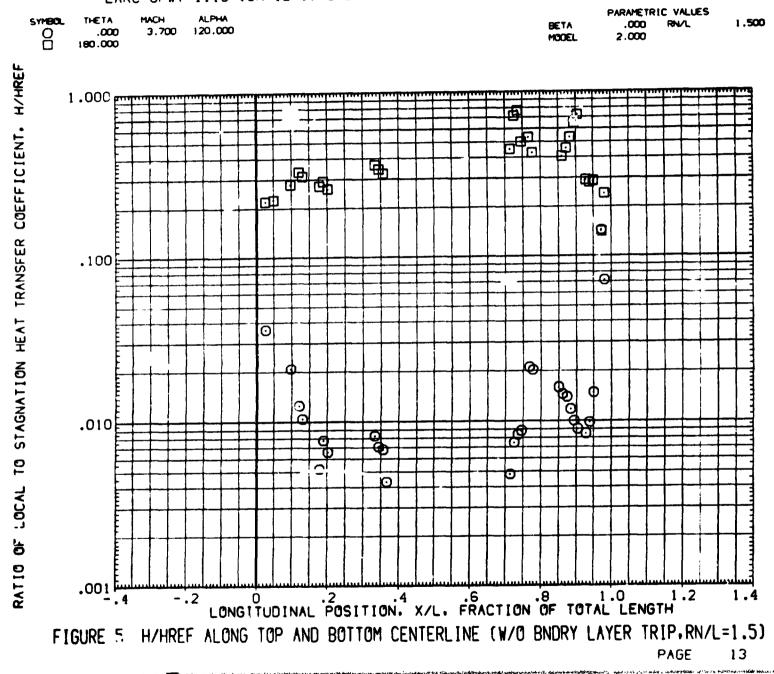
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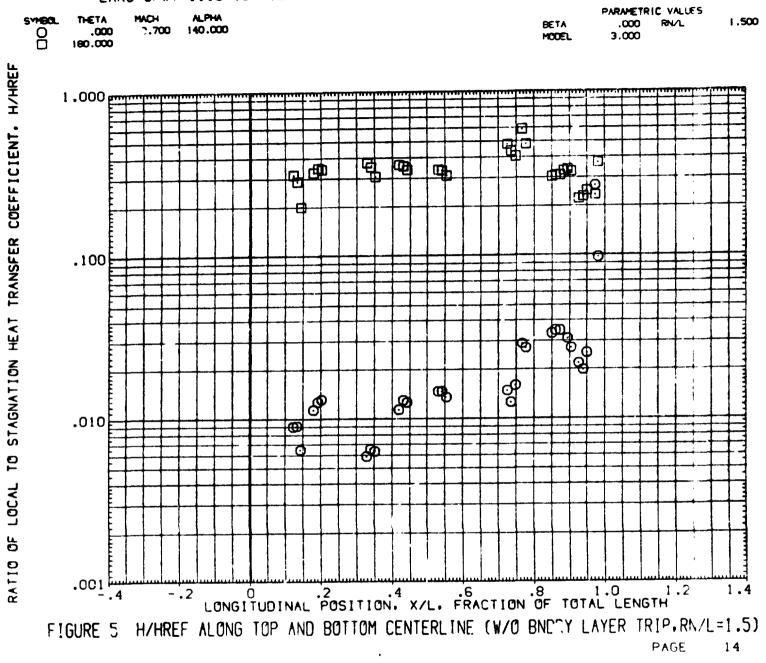




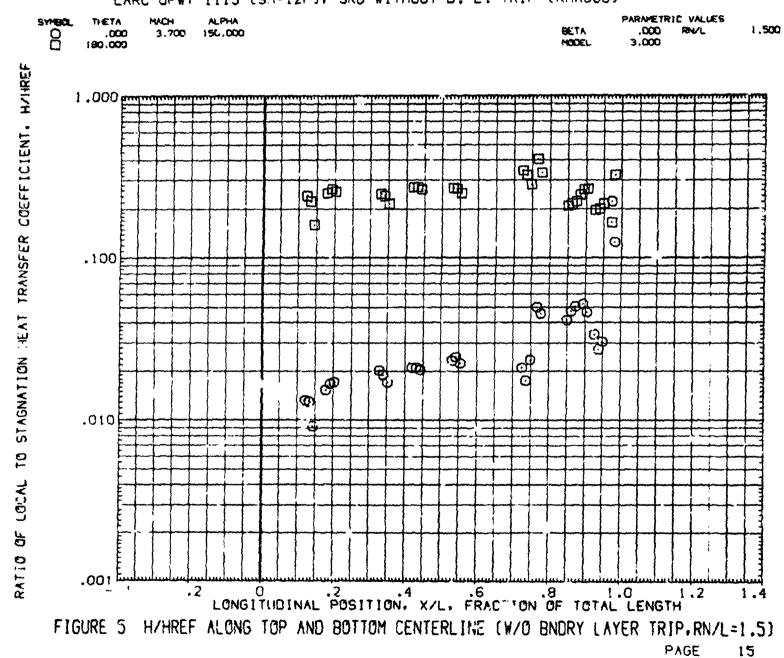


PAGE 12

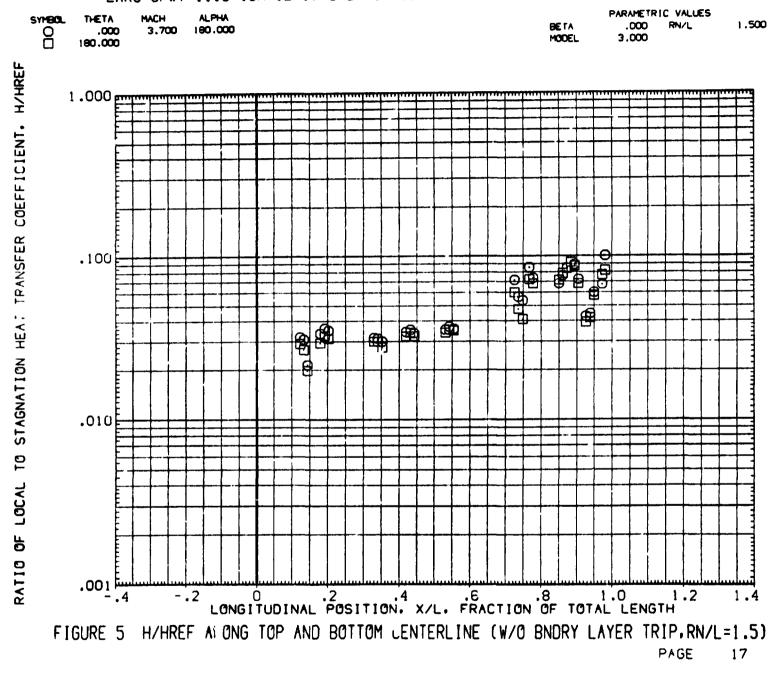




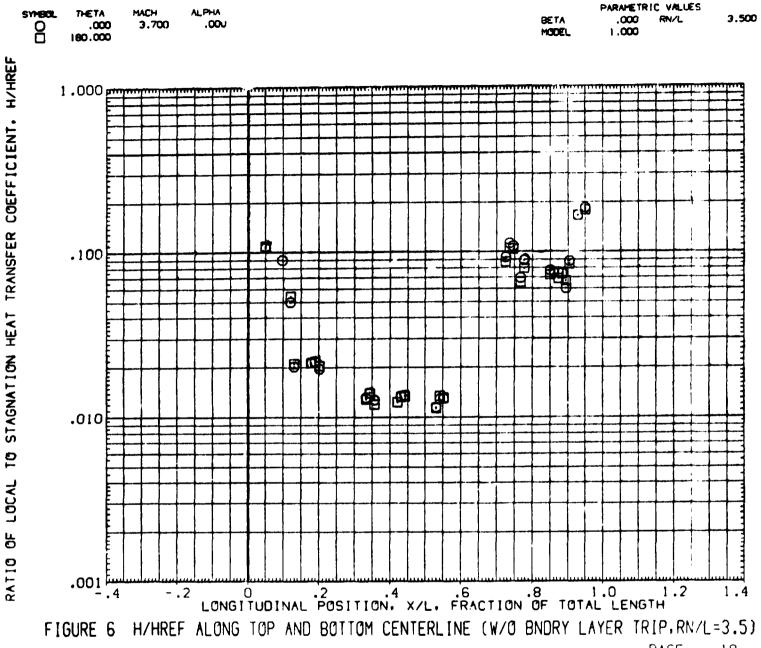




LARC UPWT 1115 (SH 12F), SR3 WITHOUT B. L. TRIP (RHA009) PARAMETRIC VALUES MACH ALPHA 3,700 170,000 SYMBOL 1.500 BETA .000 .000 MODEL 3.000 190.000 TO STAGNATION HEAT TRANSFER COEFFICIENT. HARREF 1.000 pm .100 [-Ø .010 OF LOCAL RATIO .001 O .2 .4 .6 .8 1.0 1
LONGITUDINAL POSITION, X/L, FRACTION OF TOTAL LENGTH 1.2 FIGURE 5 H/HREF ALONG TOP AND BOTTOM CENTERLINE (W/O BNDRY LAYER TRIP, RN/L=1.5) PAGE

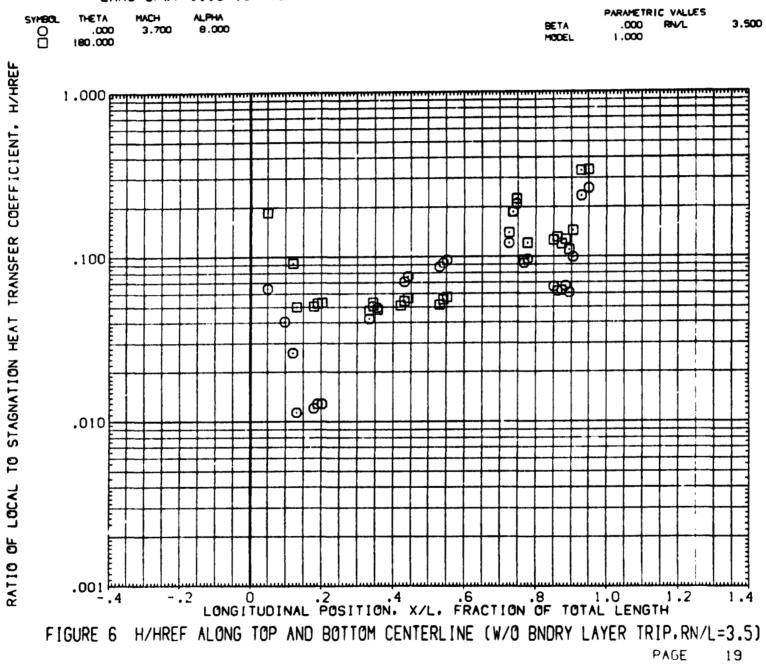


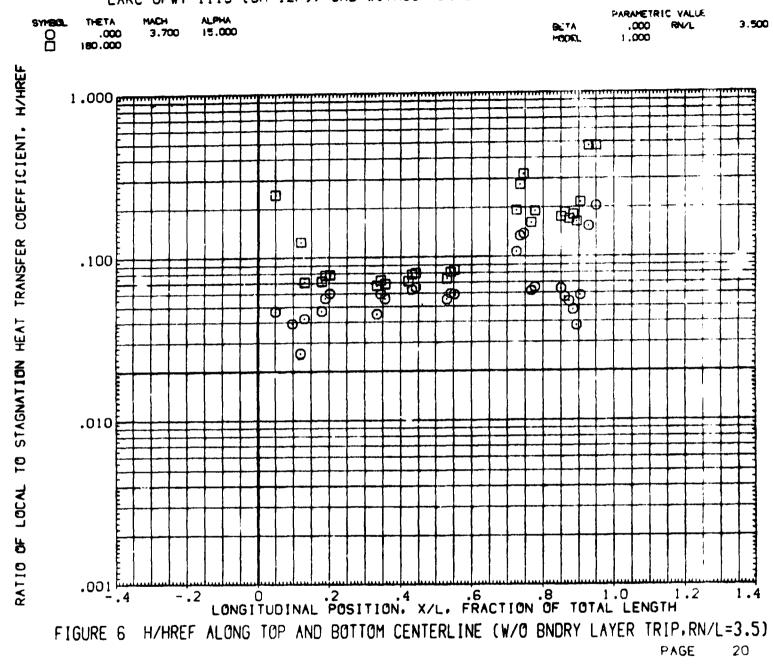
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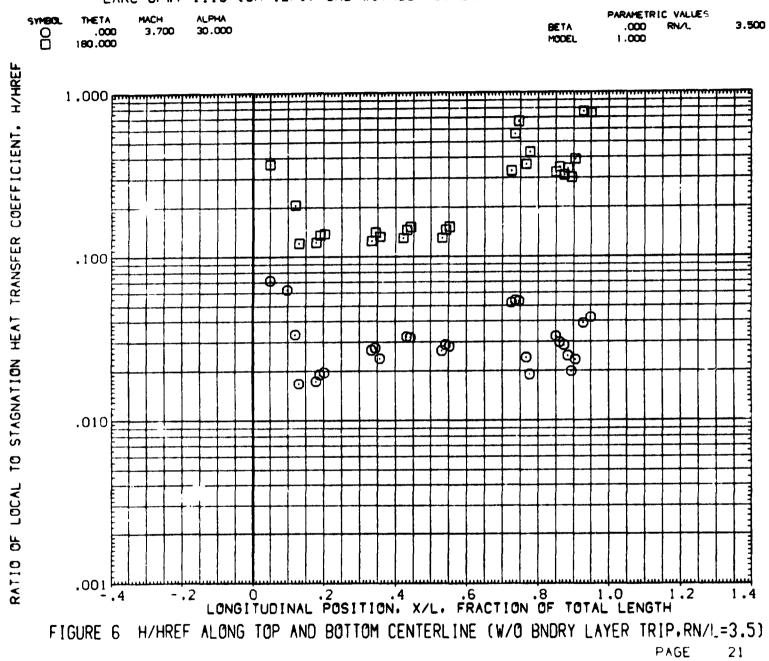


PAGE 18

LARC UPWT 1115 (SH-12F), SRB WITHOUT B. L. TRIP (RHA005)

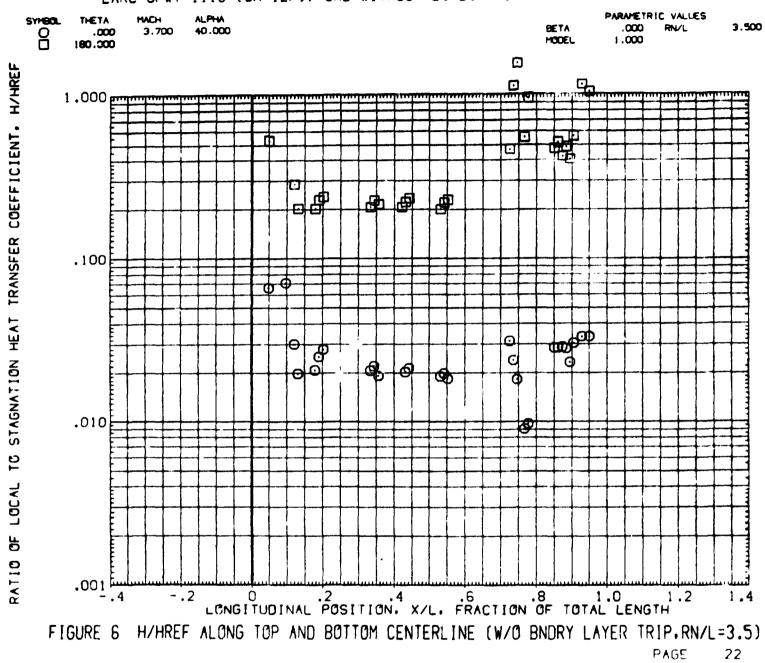




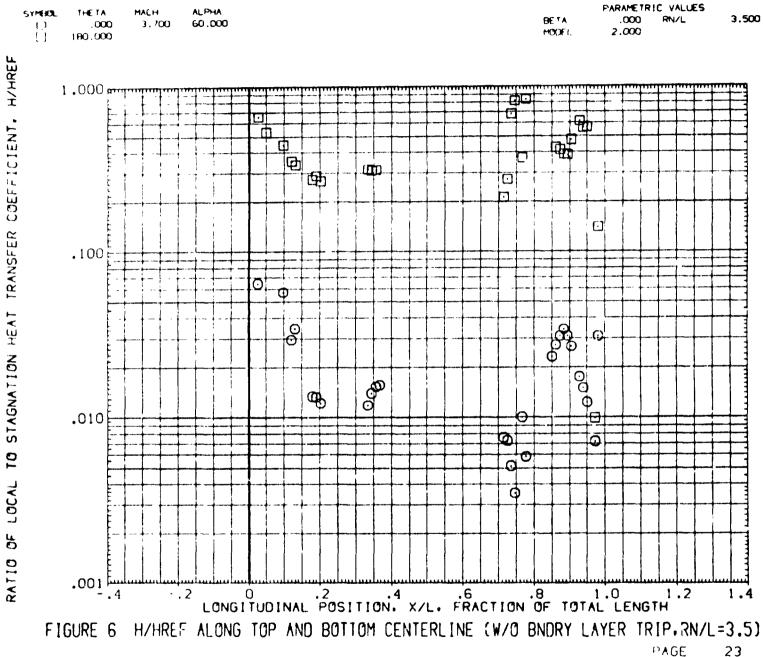


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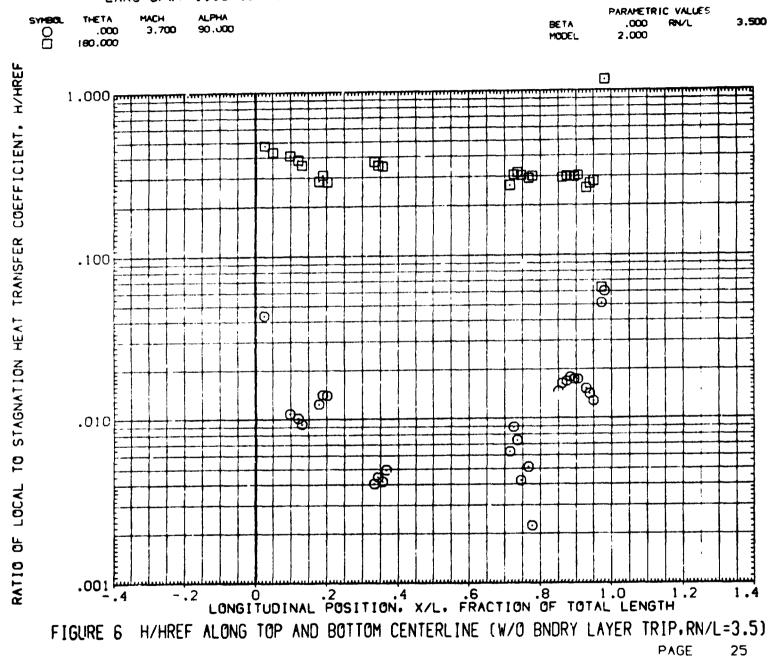
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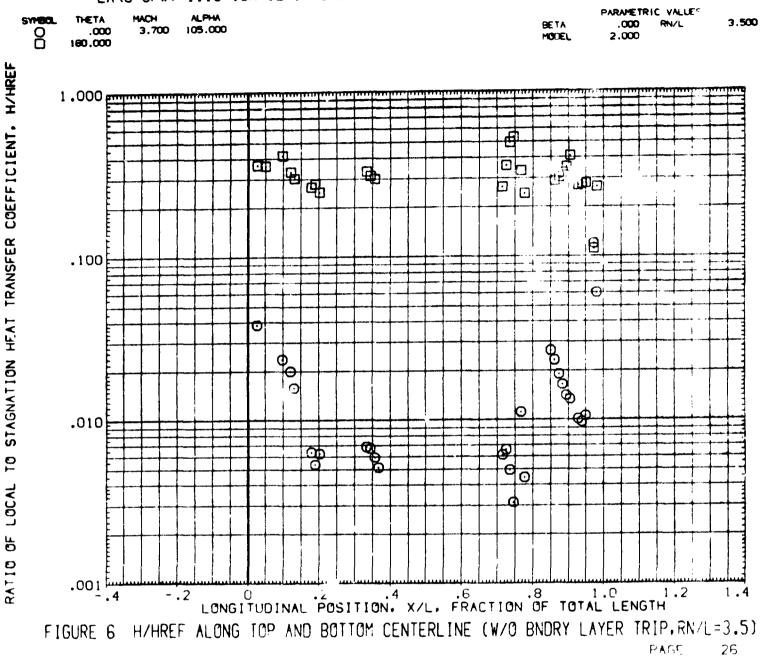


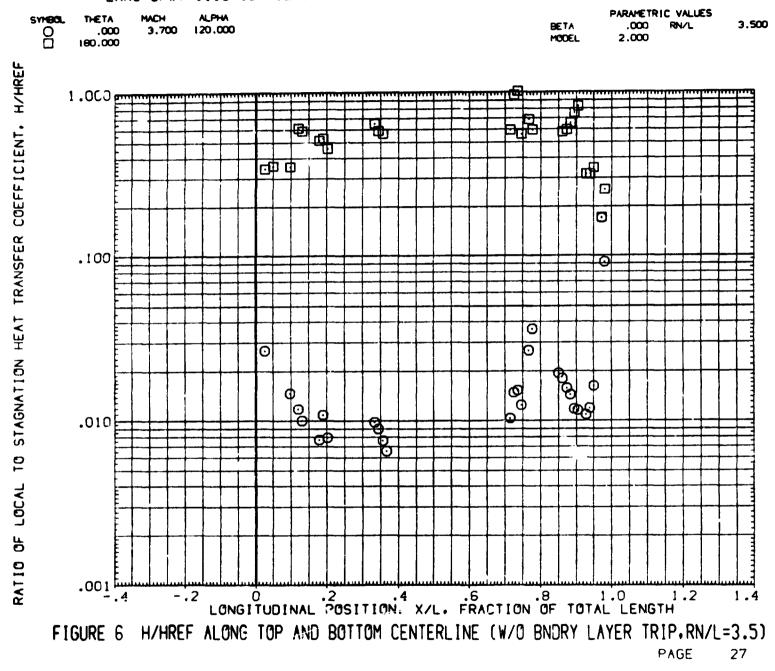
LARC UPWT 1115 (SH-12F), SRB WITHOUT B. L. TKIP (RHA007)



PARAMETRIC VALUES ALPHY. 3.500 .000 .000. 2,762 15,400 BETA 0 MODEL 2.000 H/HREF 1.000 pm STAGNATION HEAT TRANSFER COEFFICIENT. 冊 .100 0 0 .010 RATIO OF LOCAL TO 0 سا 200. LONGITUDINAL POSITION, X/L, FRACTION OF TOTAL LENGTH FIGURE 6 H/HREF ALONG TOP AND BOTTOM CENTERLINE (W/O BNDRY LAYER TRIP, RN/L=3.5) PAGE 24







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LARC UPWT 1115 (SH-12F), SRB WITHOUT B. L. TRIP (RHA010)

 SYMBOL
 THETA
 MACH
 ALPHA
 PARAMETRIC VALUES

 ○
 .000
 3.700
 140.000
 BETA
 .000
 RN/L
 3.500

 □
 180.000
 MODEL
 ∋.000

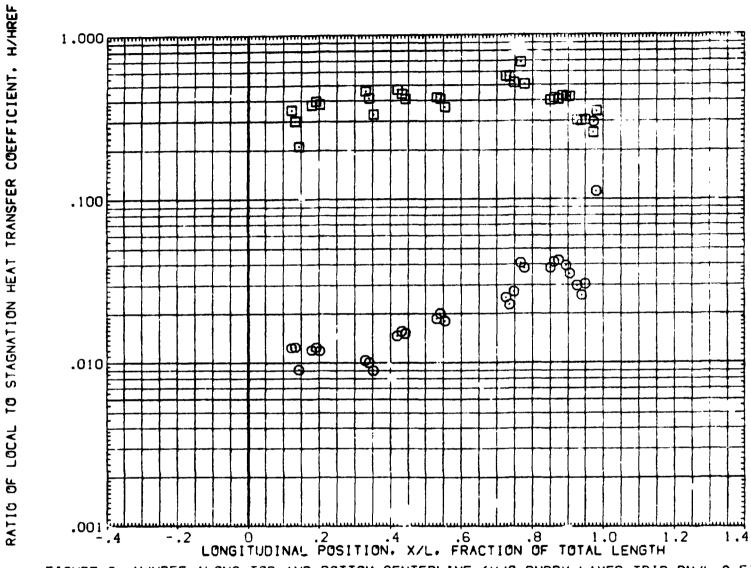


FIGURE 6 H/HREF ALONG TOP AND BOTTOM CENTERLINE (W/O BNDRY LAYER TRIP, RN/L=3.5)
PAGE 28

LARC UPWT 1115 (SH-12F), SRB WITHOUT B. L. TRIP (RHA010)



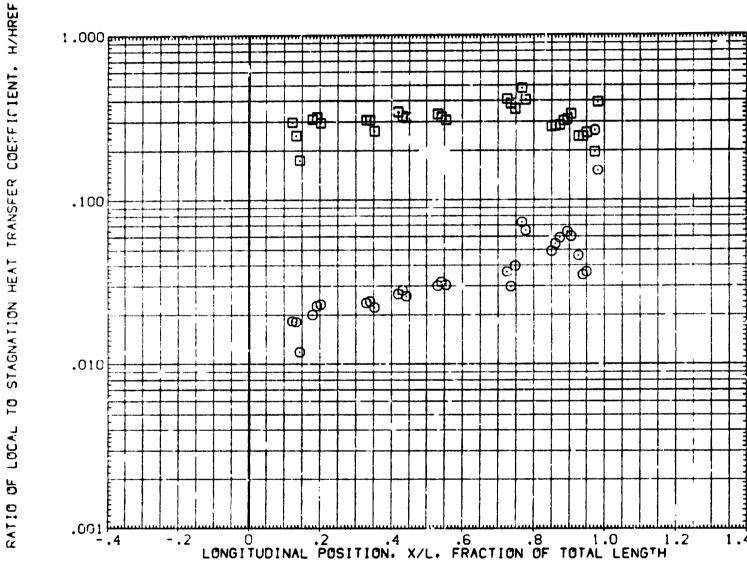


FIGURE 6 H/HREF ALONG TOP AND BOTTOM CENTERLINE (W/O BNDRY LAYER TRIP, RN/L=3.5)
PAGE 29

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LARC UPWT 1115 (SH-12F), SRB WITHOUT B. L. TRIP (RHA010) PARAMETRIC VALUES SYMOOL THETA .000 RN/L 3.500 BETA 160.000 .000 3.700 8 MODEL 3.000 TO STAGNATION HEAT TRANSFER COEFFICIENT, H/HREF 1.000 բողուդուս 0 .100 .010 -רטכער ų. RATIO

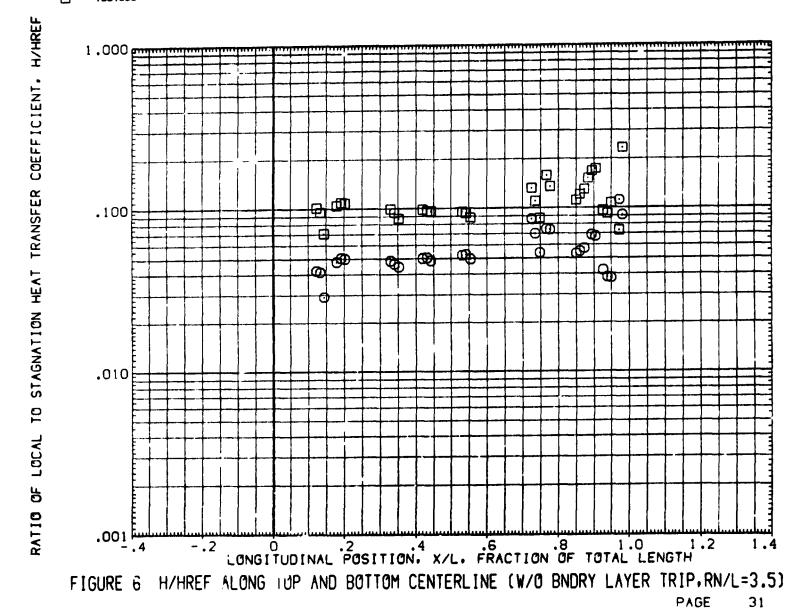
LONGITUDINAL POSITION, X/L. FRACTION OF TOTAL LENGTH FIGURE 6 H/HREF ALONG TOP AND BOTTOM CENTERLINE (W/O BNDRY LAYER TRIP, RN/L=3.5) PAGE 30

LARC UPWT 1115 (SH-12F). SRB WITHOUT B. L. TRIP (RHA010)

 SYMBOL
 THETA
 MACH
 ALPHA
 PARAMETRIC VALUES

 ∴ .070
 3.700
 170.000
 BETA
 .000
 RN/L
 3.500

 ☐ 180.000
 M00EL
 3.000



LARC UPWT 1115 (SH-12F), SRB WITHOUT B. L. TRIP (RHAD10) PARAMETRIC VALUES MACH ALPHA 3.700 180.000 SYMBOL THETA 3,500 BETA .000 RN/L .000 MODEL 3.000 180,000 STAGNATION HEAT TRANSFER COEFFICIENT. HZHREF 1.000 բողուդ .100 .010} 10 RATIO OF LOCAL .001 O .2 .4 .6 .8 1.0 .2
LONGITUDINAL POSITION, X/L. FRACTION OF TOTAL LENGTH

FIGURE 6 H/HREF ALONG TOP AND BOTTOM CENTERLINE (W/O BNDRY LAYER TRIP, RN/L=3.5) PAGE 3**2** 

LARC UPWT 1115 (SH-12F). SRB WO/BL TRIP AND RING(RHA002)

 SYMBOL THETA
 MACH
 ALPHA
 PARAMETRIC VALUES

 ○ .000
 3.700
 30.000
 BETA
 .000
 RN/L
 3.500

 □ 160.000
 MODEL
 1.000

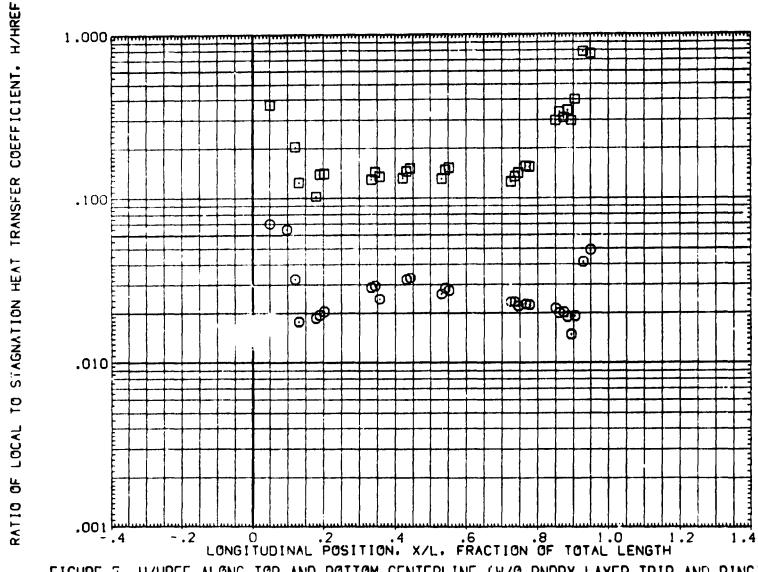
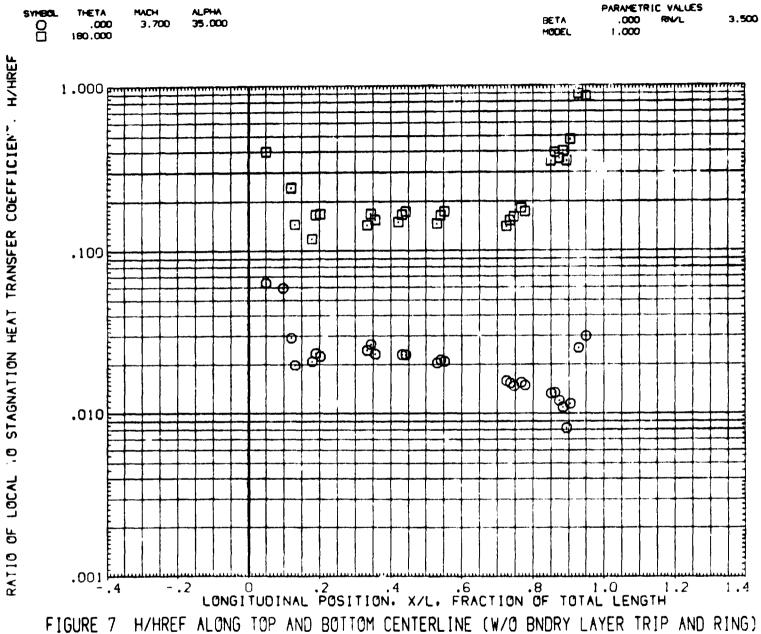


FIGURE 7 H/HREF ALONG TOP AND BOTTOM CENTERLINE (W/O BNDRY LAYER TRIP AND RING)
PAGE 33

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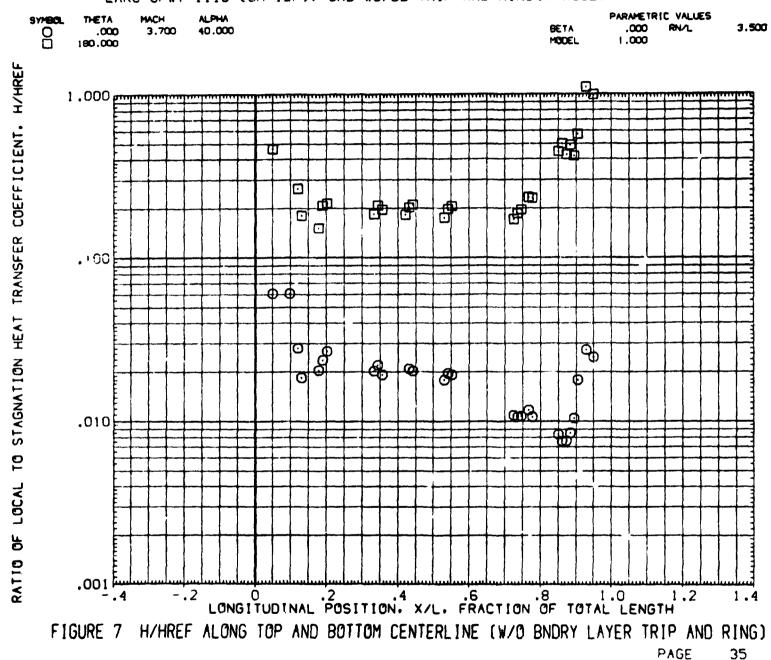
LARC UPWT 1115 (SH-12F), SRB WO/BL TRIP AND RING(RHA002)

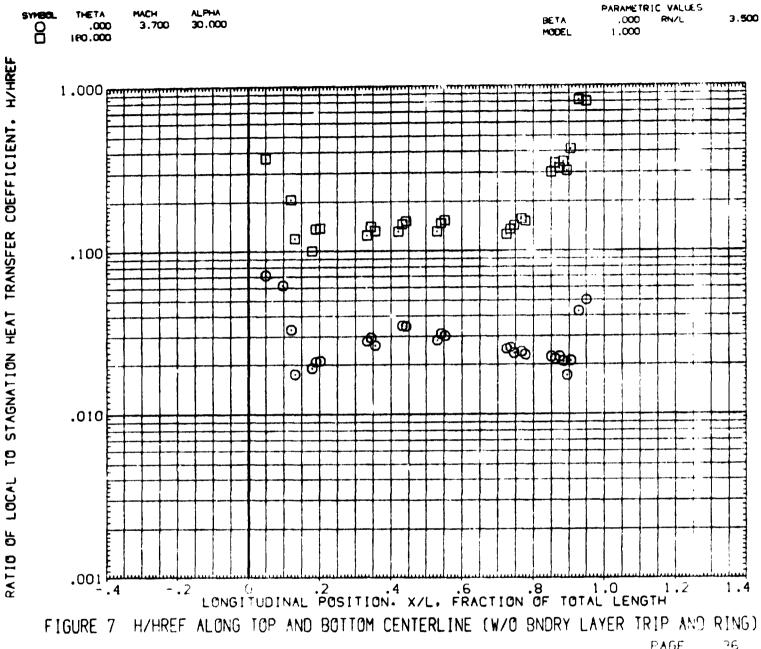


PAGE 34



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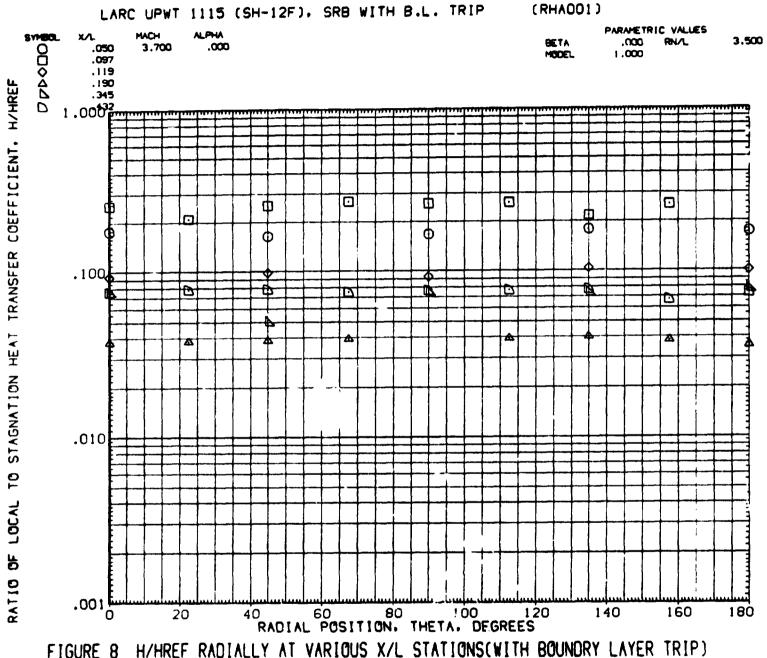


FIGURE 8 H/HREF RADIALLY AT VARIOUS X/L STATIONS(WITH BOUNDRY LAYER TRIP)

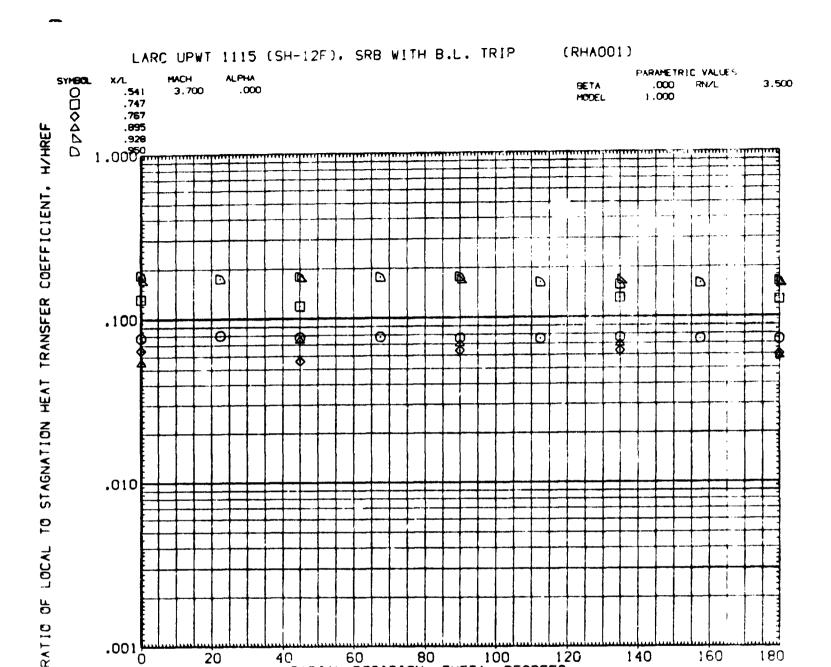


FIGURE 8 HIHREF RADIALLY AT VARIOUS XIL STATIONS(WITH BOUNDRY LAYER TRIP PAGL

0 60 80 100 12 RADIAL POSITION, THETA, DEGREES

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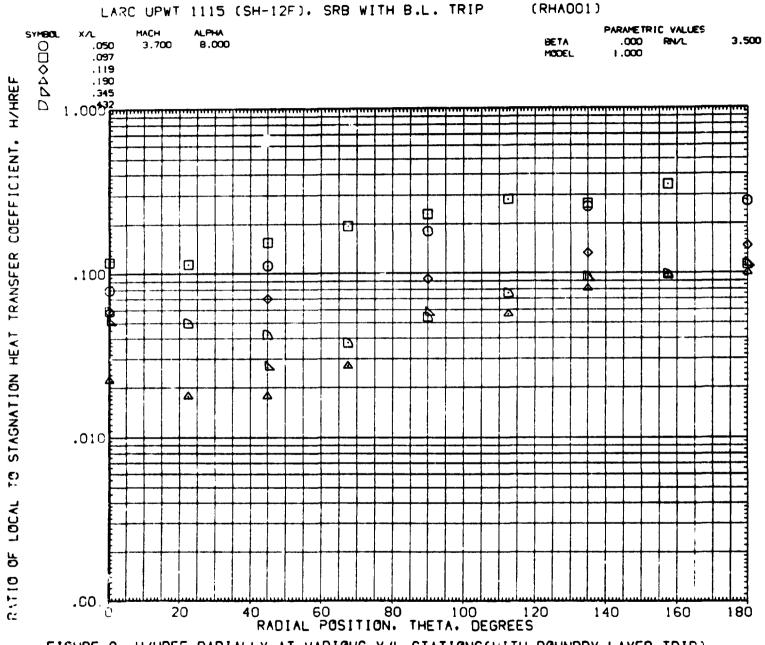
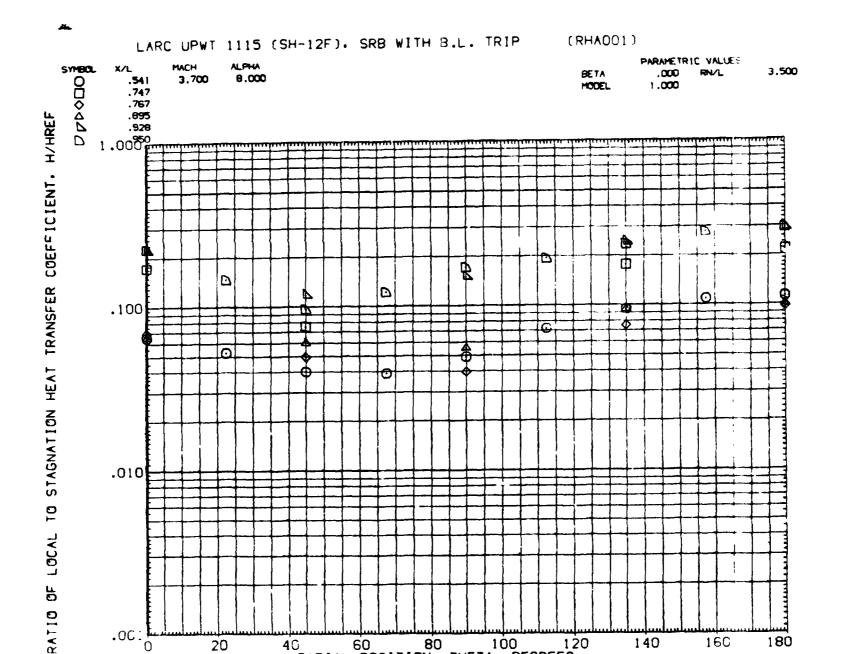


FIGURE 8 H/HREF RADIALLY AT VARIOUS X/L STATIONS(WITH BOUNDRY LAYER TRIP)



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.100

.010

.001

20

FIGURE 8 H/HREF RADIALLY AT VARIOUS X/L STATIONS(WITH BOUNDRY LAYER TRIF) PAGE 40

40 60 80 100 12 RADIAL POSITION, THETA, DEGREES

120

140

180

160

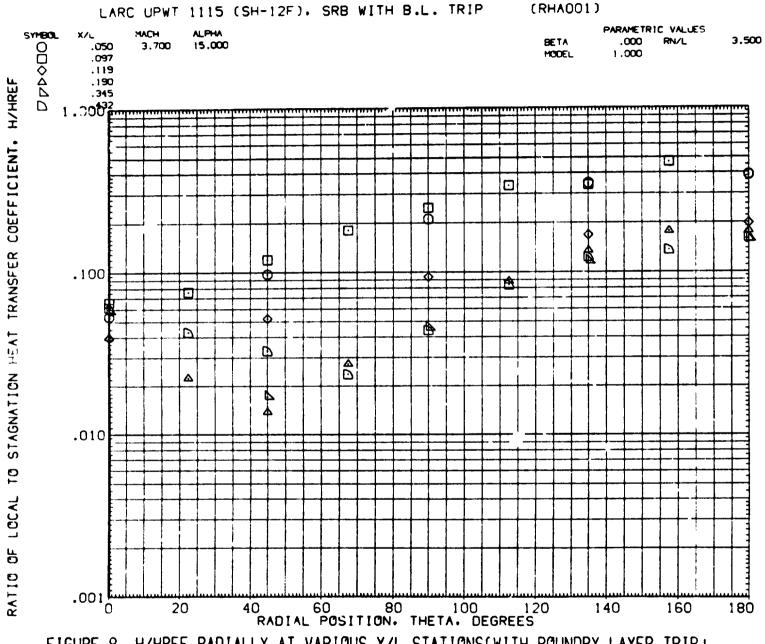
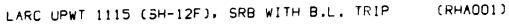


FIGURE 8 H/HREF RADIALLY AT VARIOUS X/L STATIONS(WITH BOUNDRY LAYER TRIP)



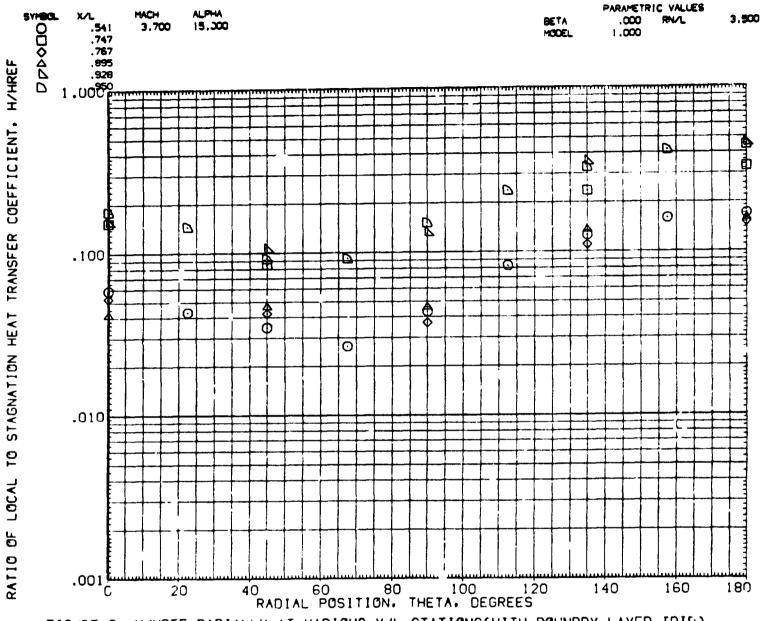


FIGURE 8 H/HREF RADIALLY AT VARIOUS X/L STATIONS(WITH BOUNDRY LAYER TRIP)

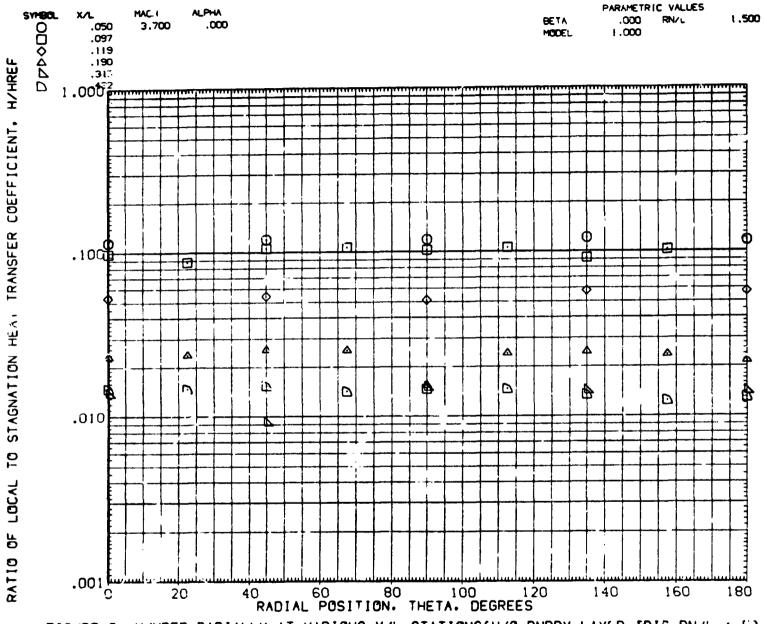


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER [RIF.RN/L=1.5)

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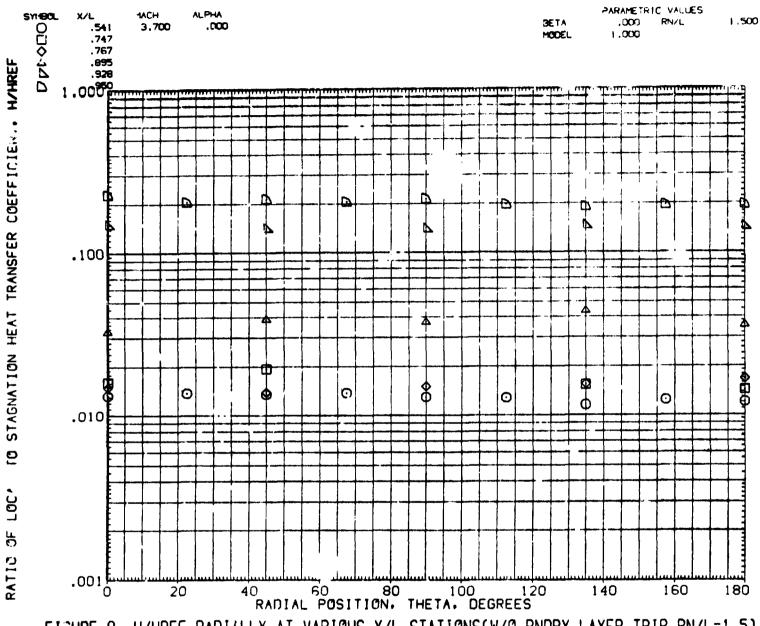


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=1.5)

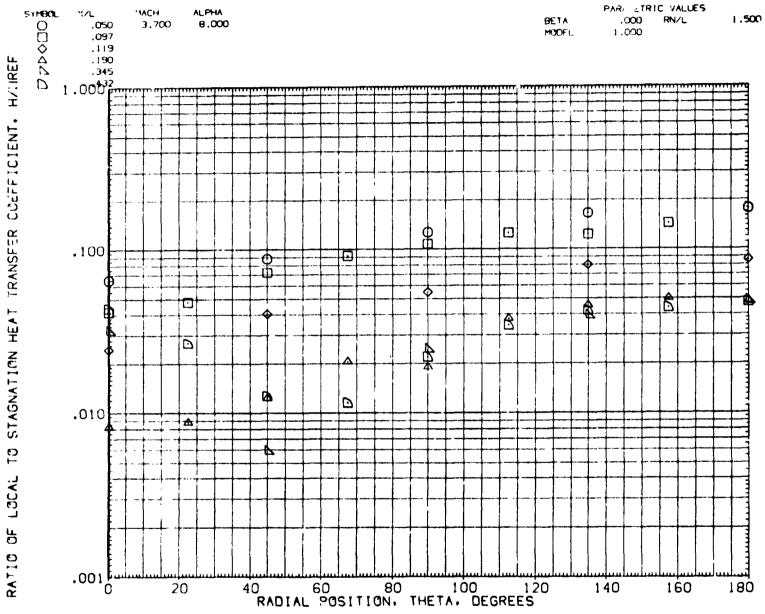


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=1.5)
PAGE 45

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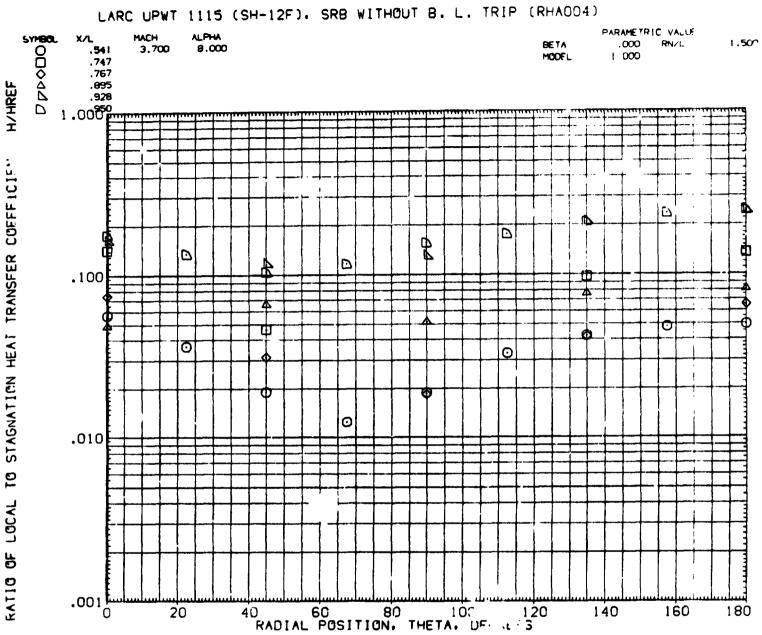


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=1.5)
PAGE 46

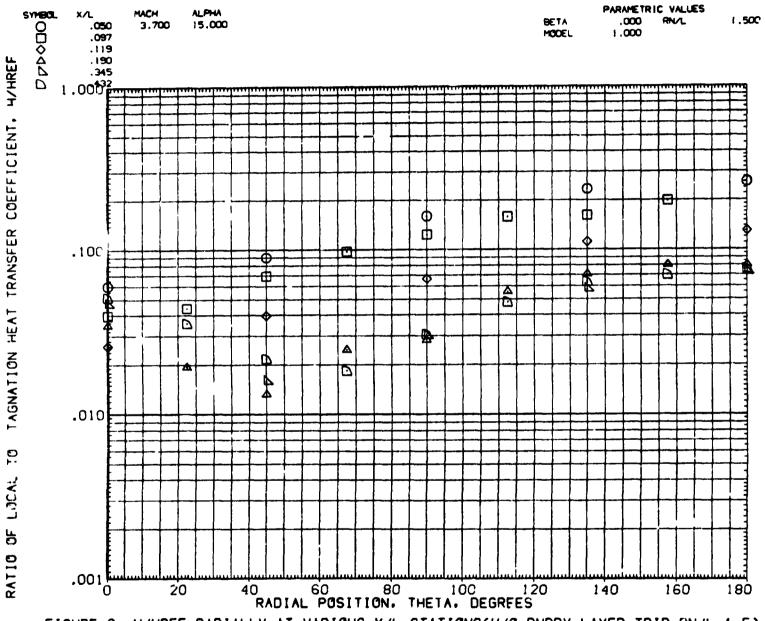


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP.RN/L=1.5)
PAGE 47

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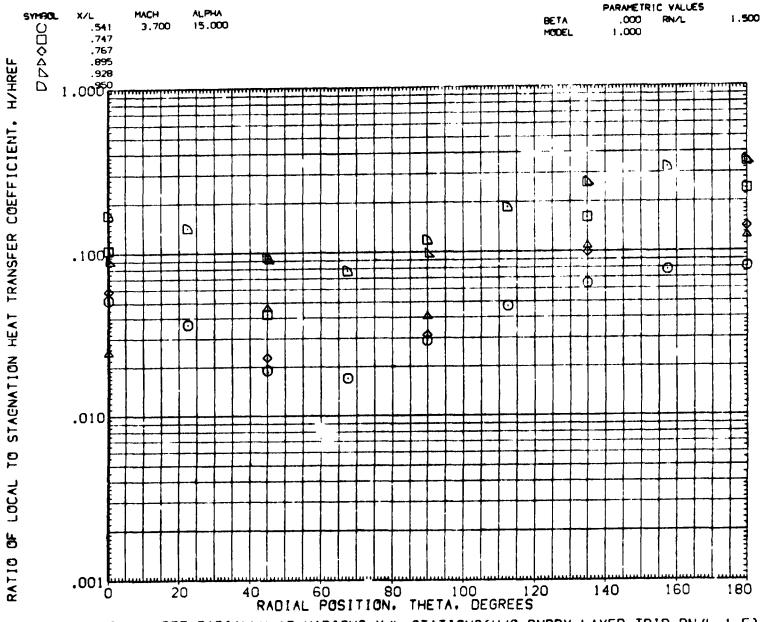


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP,RN/L=1.5)
PAGE 48

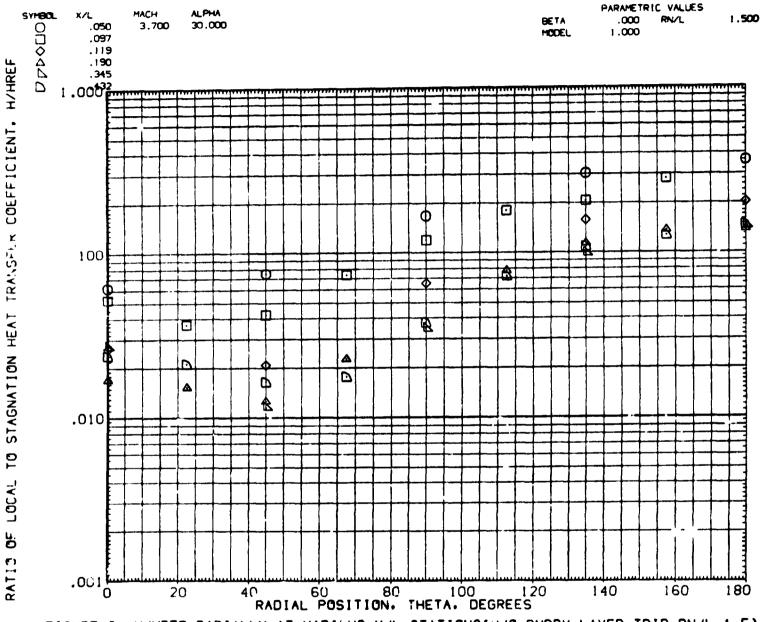


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=1.5)
PAGE 49

LARC UPWT 1115 (SH-12F). SRB WITHOUT B. L. TRIP (RHA004)

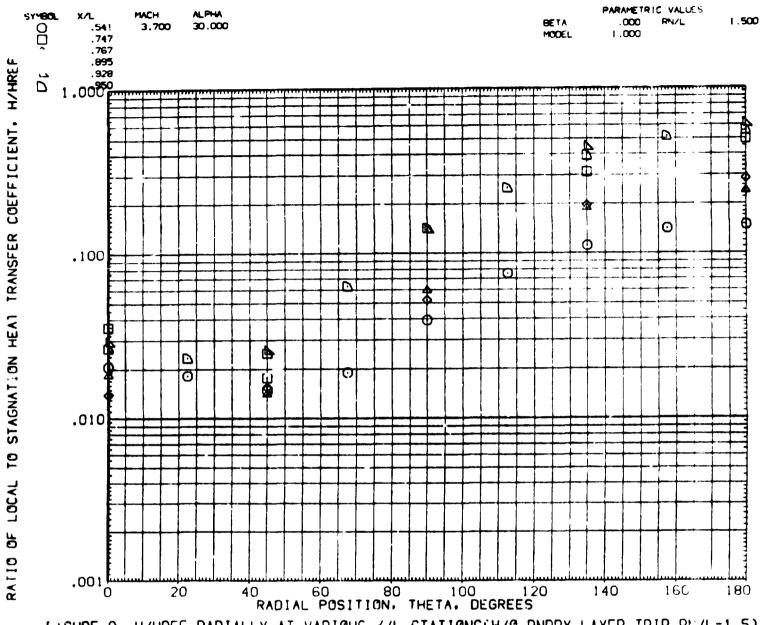


FIGURE 9 H/HREF RADIALLY AT VARIOUS K/L STATIONS(W/O BNDRY LAYER TRIP, RK/L=1.5)

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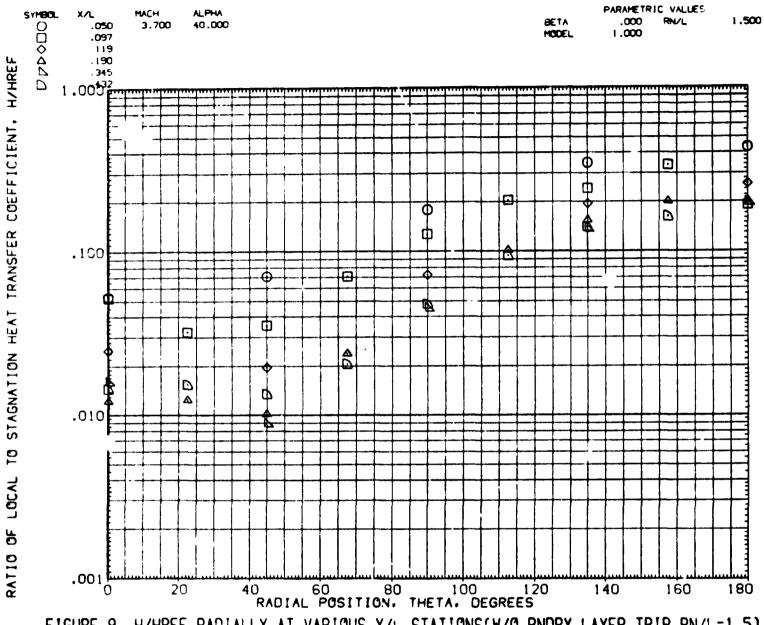


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP,RN/L=1.5)
PAGE 51

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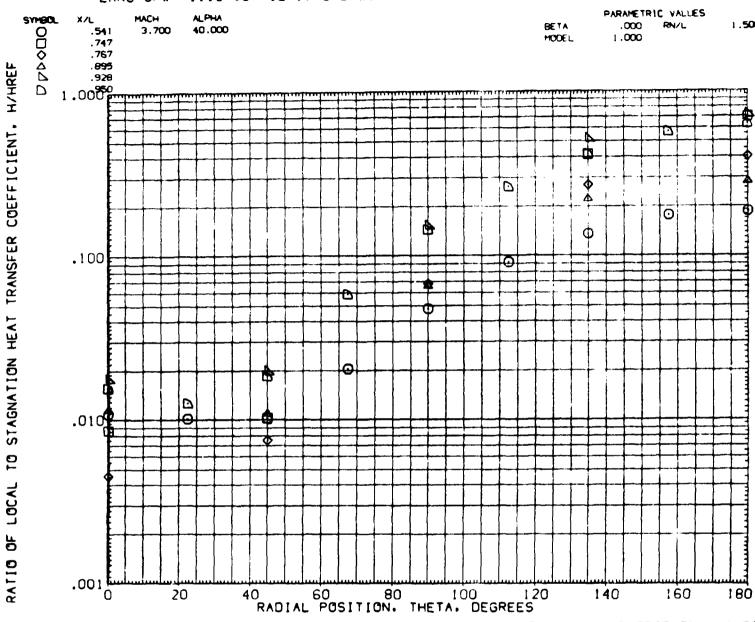


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=1.5)

PAGE 52

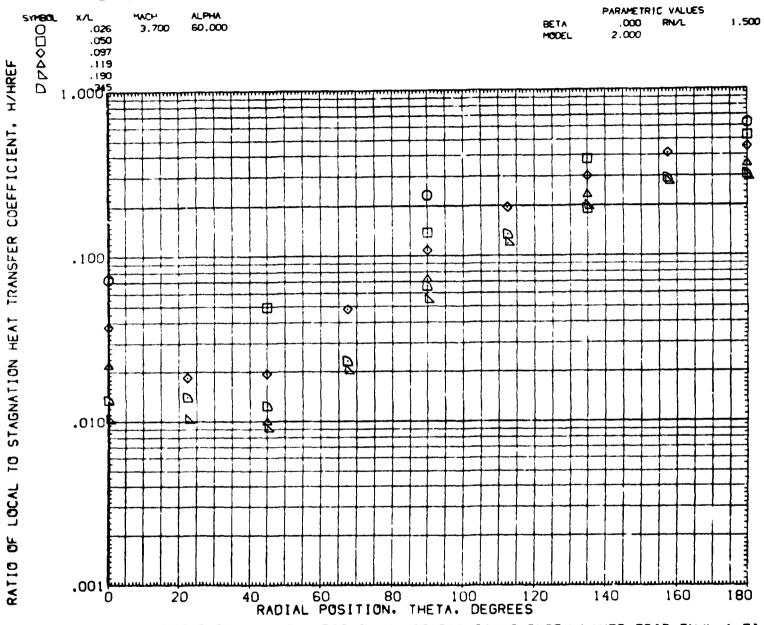


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=1.5)
PAGE 53

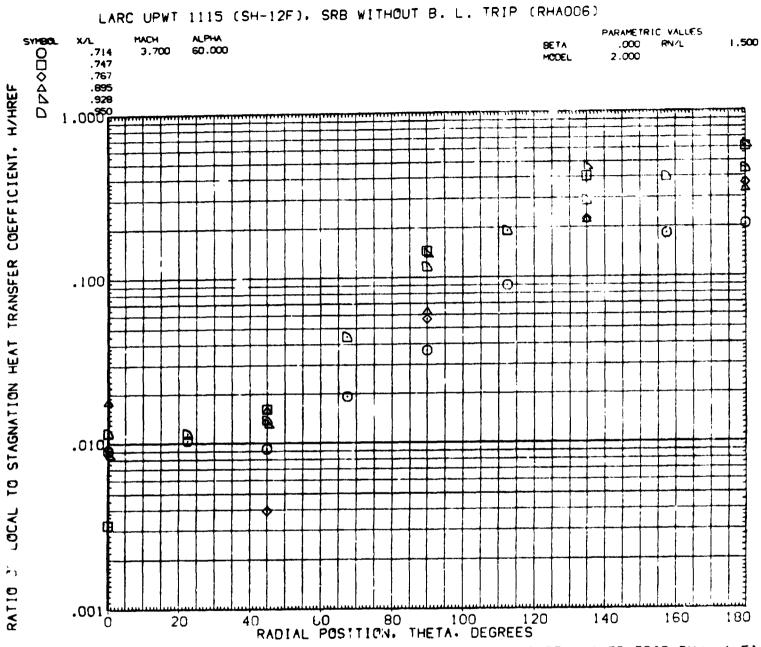


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=1.5)
PAGE 54

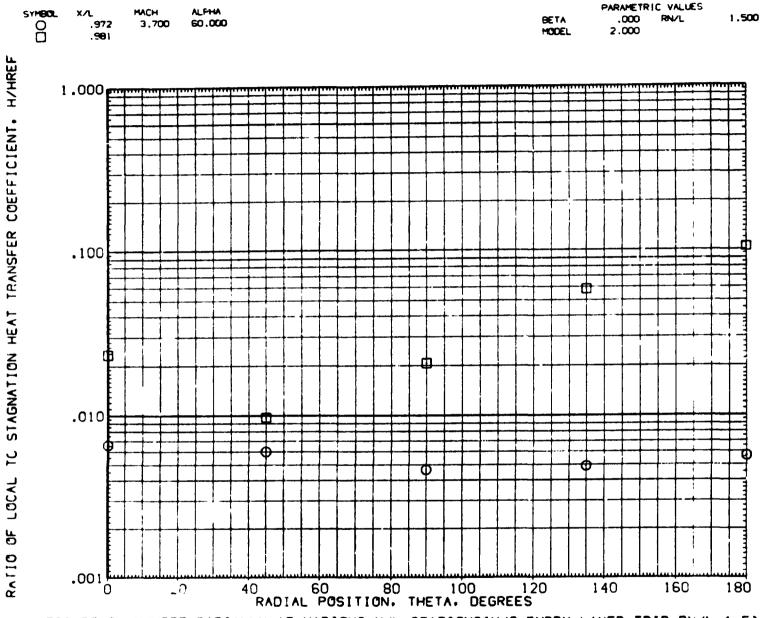
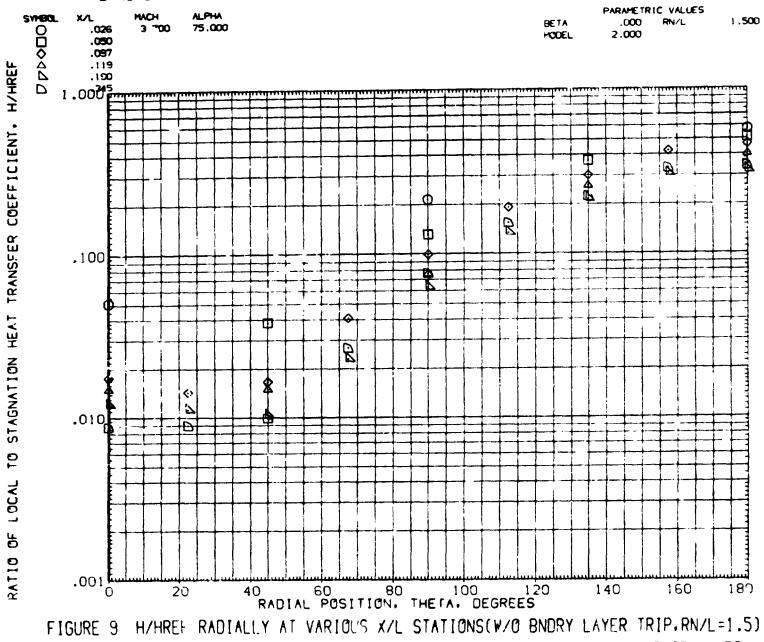
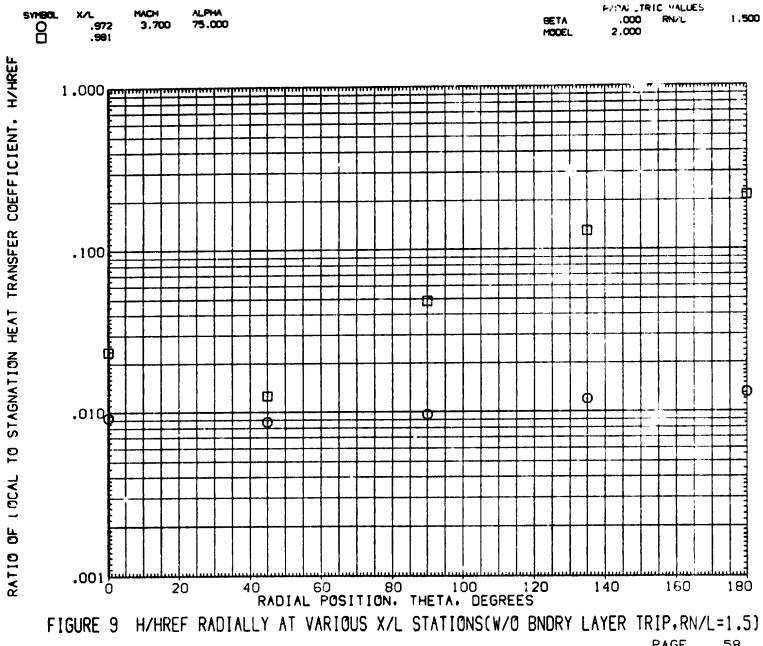


FIGURE 9 H/MREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP.RN/L=1.5)
PAGE 55



PAGE 56

FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP,RN/L=1.5)
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PAGE 58

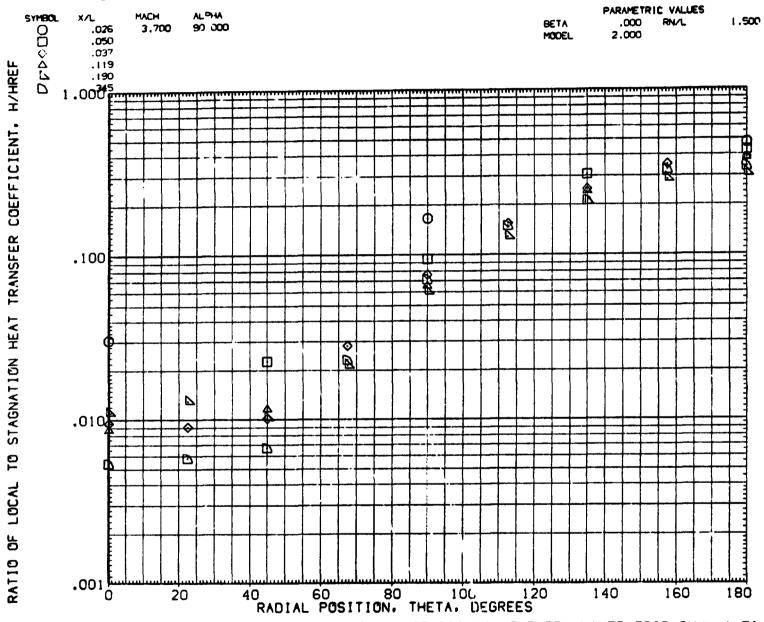


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP.RN/L=1.5)
PAGE 59

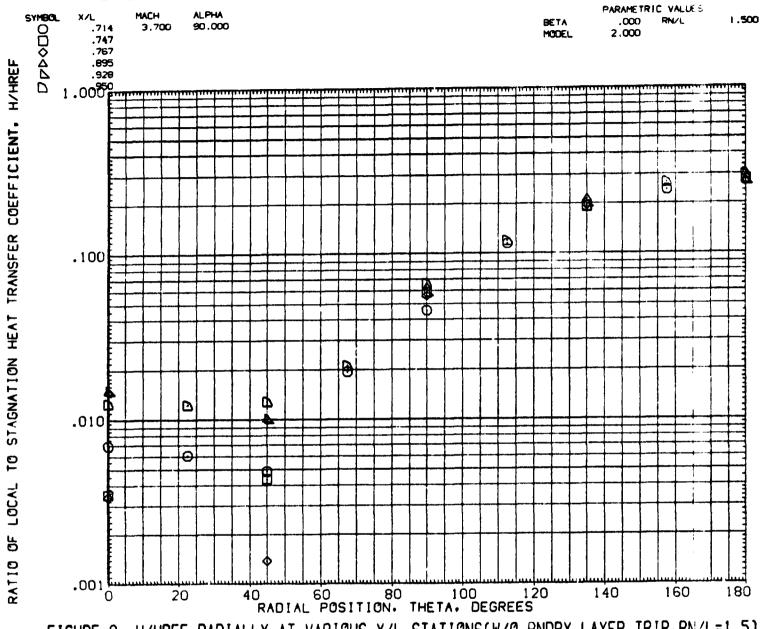
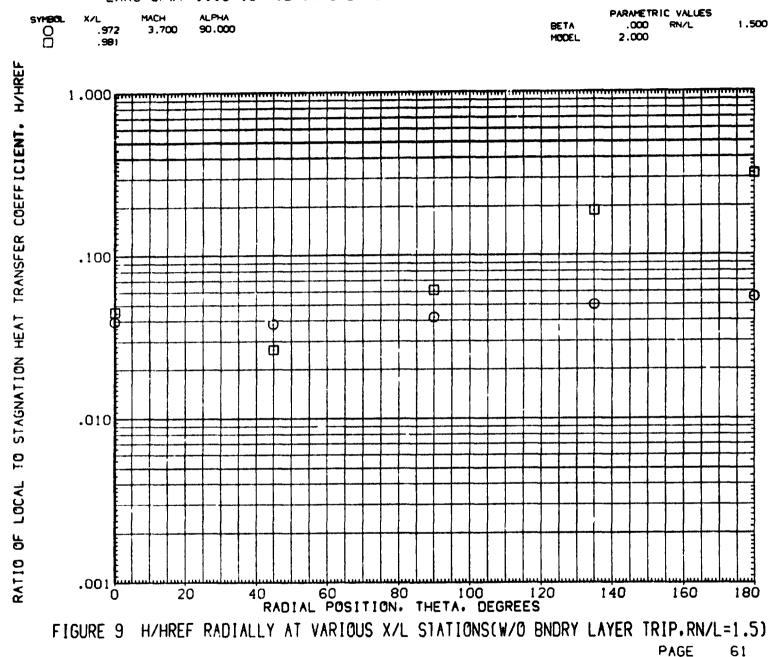


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP.RN/L=1.5)
PAGE 60

LARC UPWT 1115 (SH-12F). SRB WITHOUT B. L. TRIP (RHA006)



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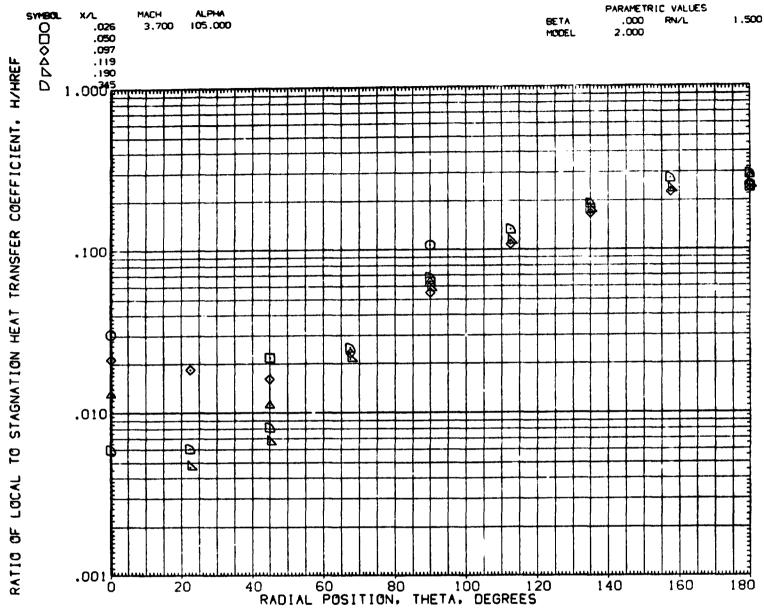


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=1.5)
PAGE 62

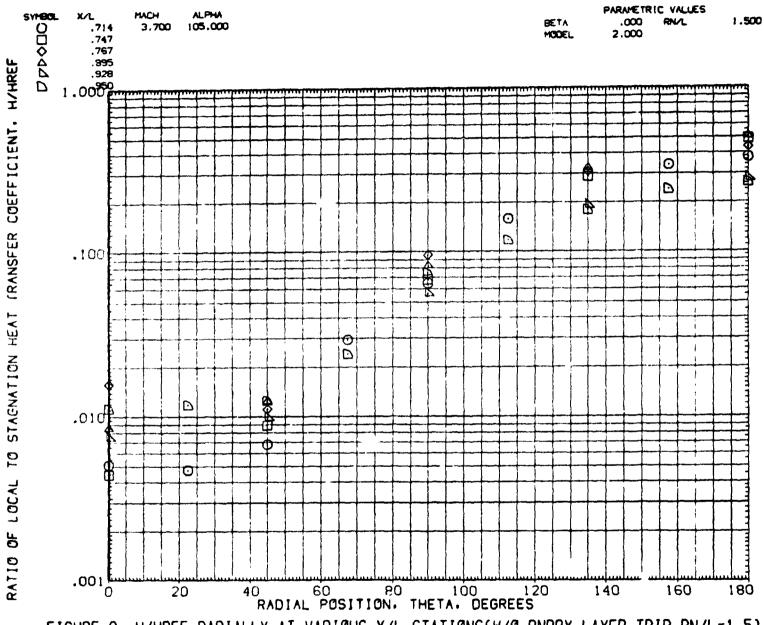
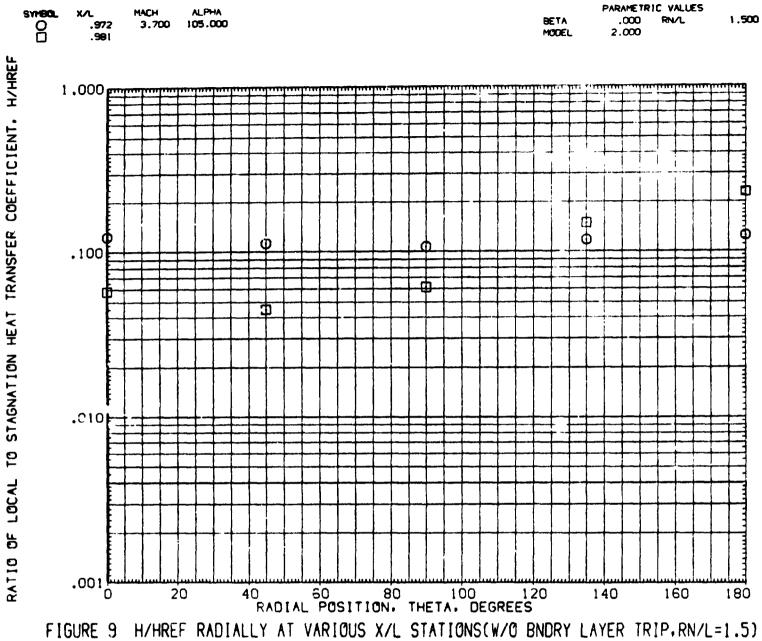


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP.RN/L=1.5)
PAGE 63



PAGE 64

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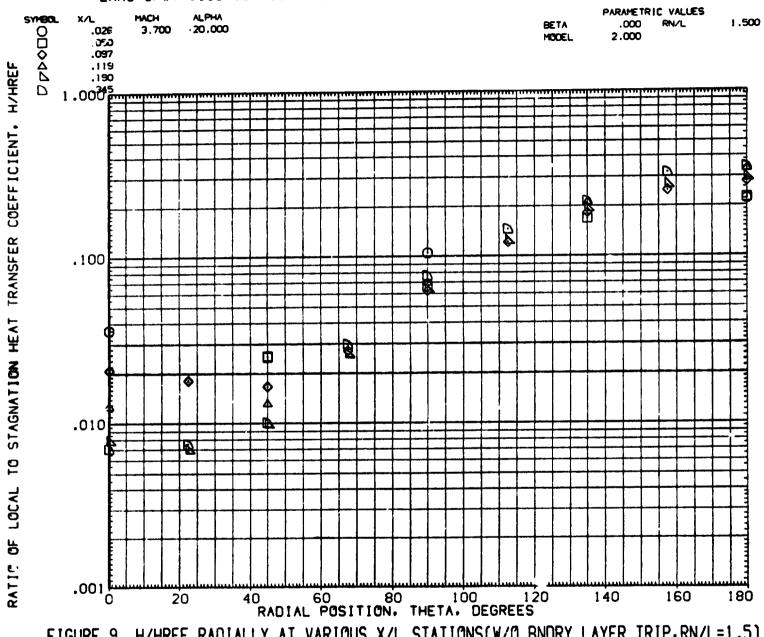


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP.RN/L=1.5)
PAGE 65

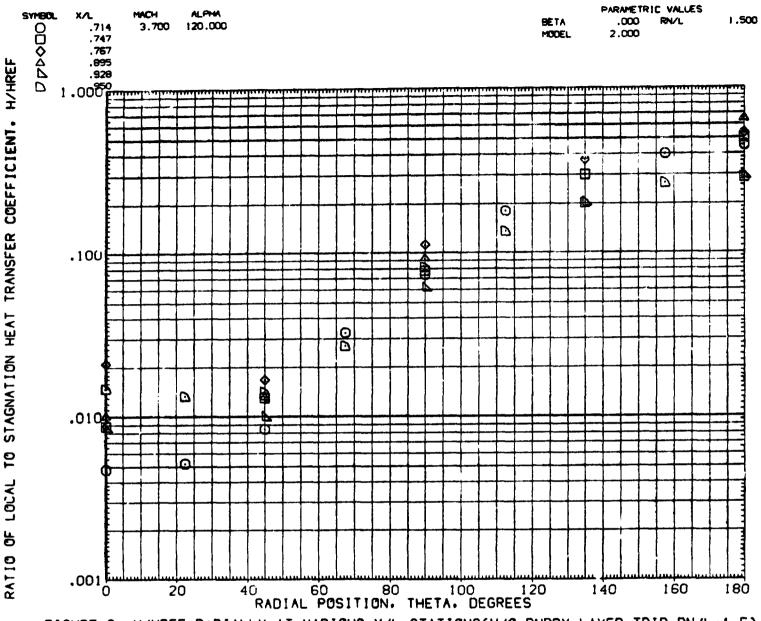
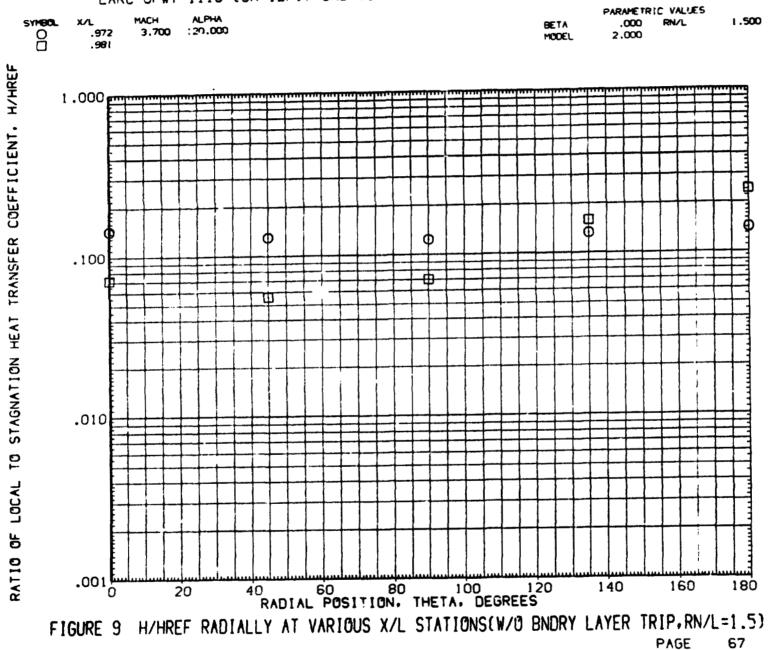


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=1.5)
PAGE 66





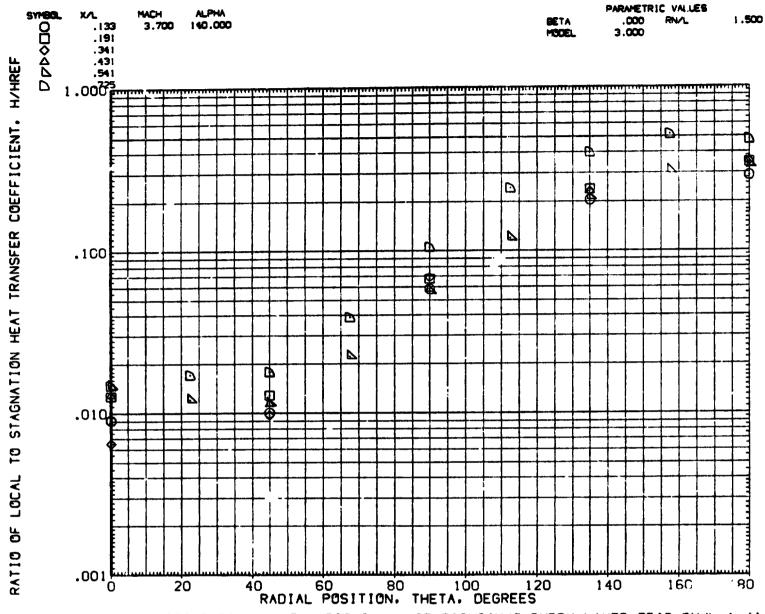


FIGURE S HI/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=1 )

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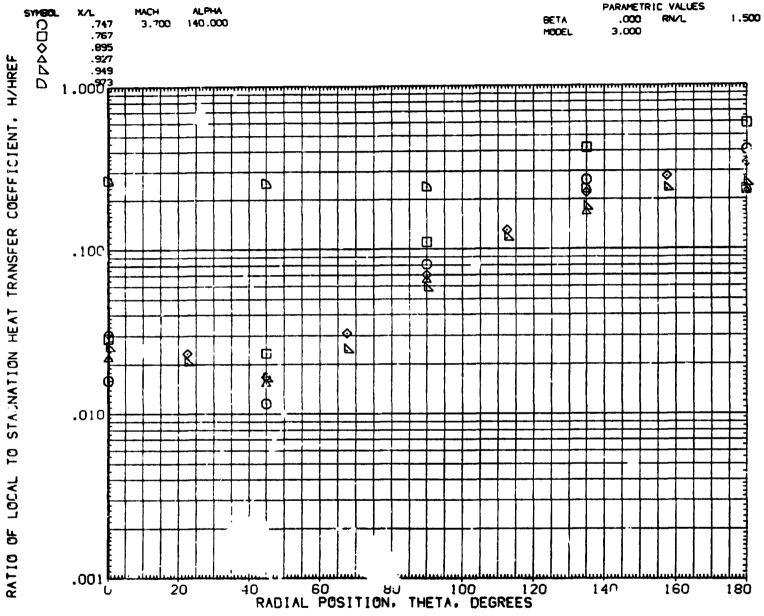


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP,RN/L=1.5)
PAGE 69

LARC UPWT 1115 (SH-12F). SRB WITHOUT B. L. TRIP (RHA009)

 SYMBOL
 X/L
 MACH
 ALPHA
 PARAMETRIC VALUES

 O
 .981
 3 .700
 140.000
 BETA
 .000
 RN/L
 1.500

 MODEL
 3 .000

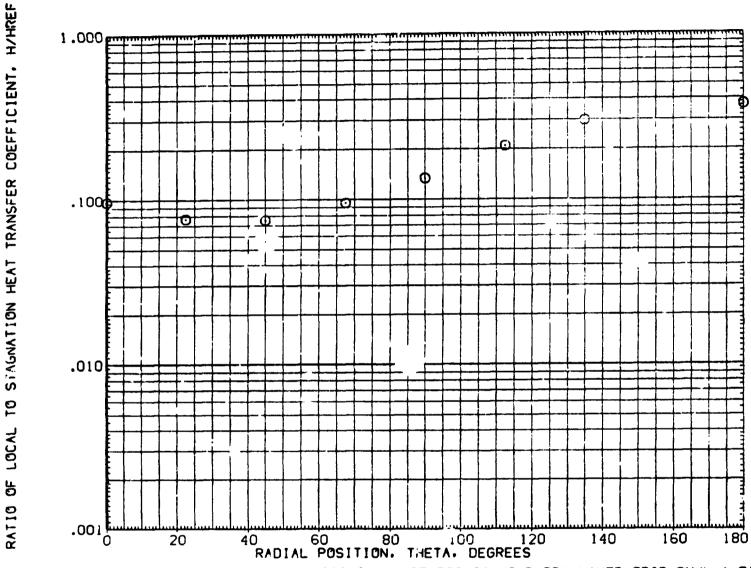
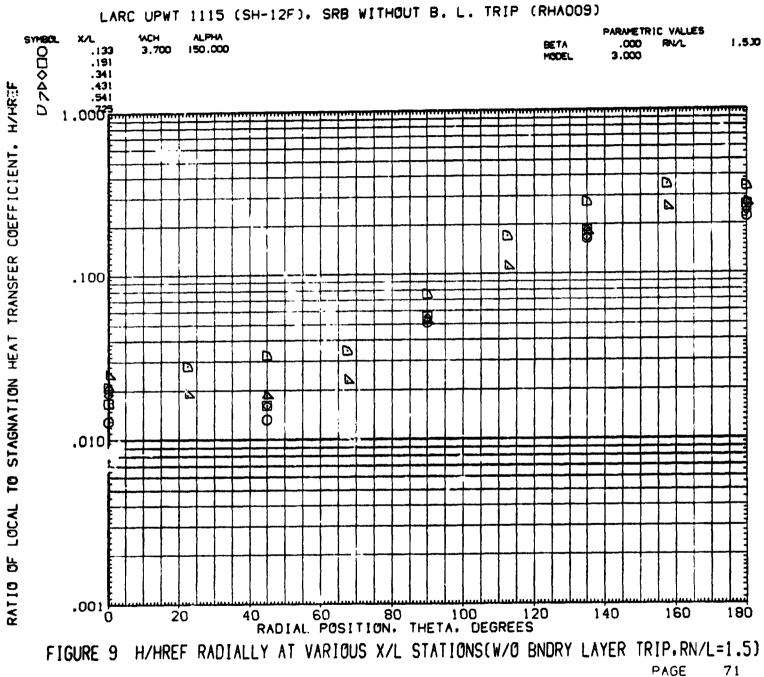


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=1.5)
PAGE 70



PAGE

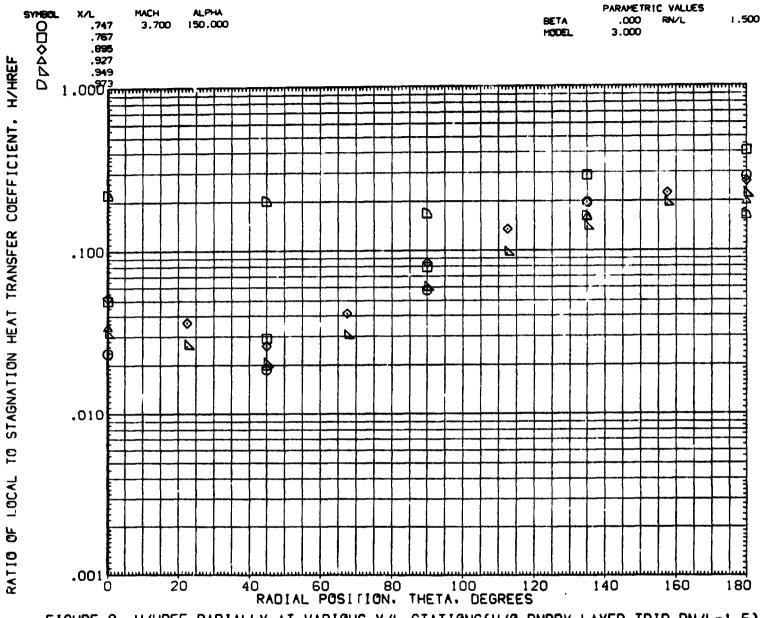


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=1.5)
PAGE 72

SYMBOL X/L MACH ALPHA

O .981 3.700 150.000

PARAMETRIC VALUES

BETA .000 RN/L 1.500

MODEL 3.000

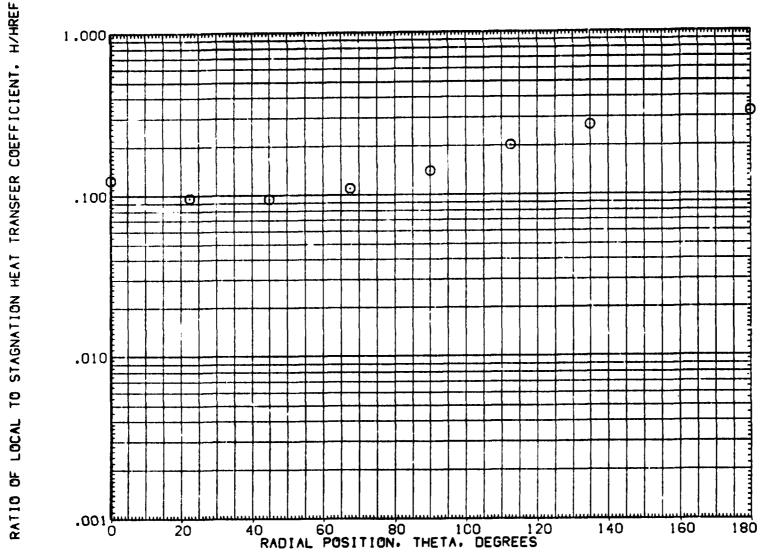


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP.RN/L=1.5)
PAGE 73

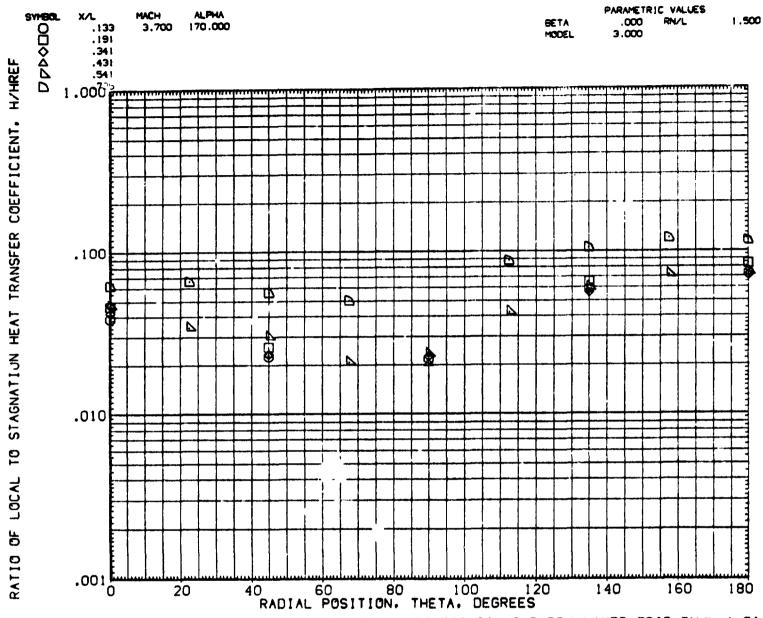
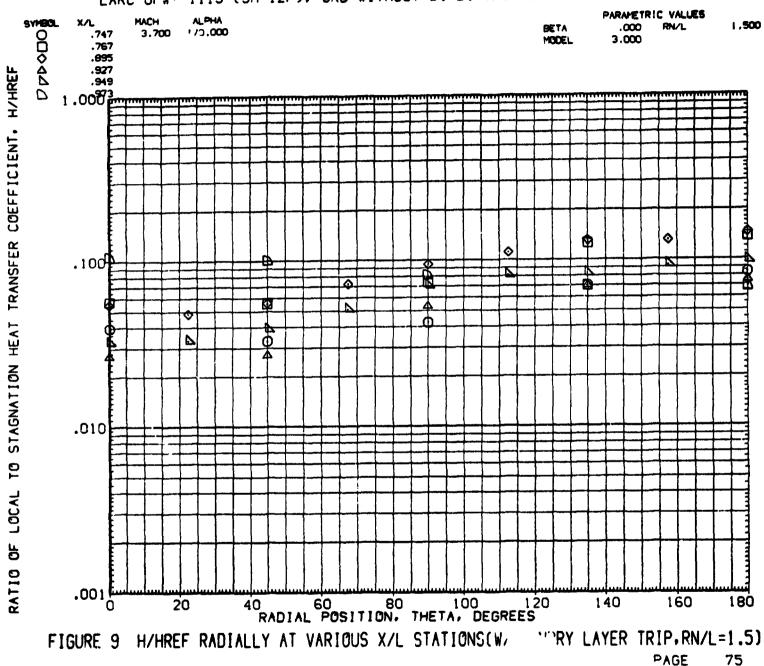


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=1.5)







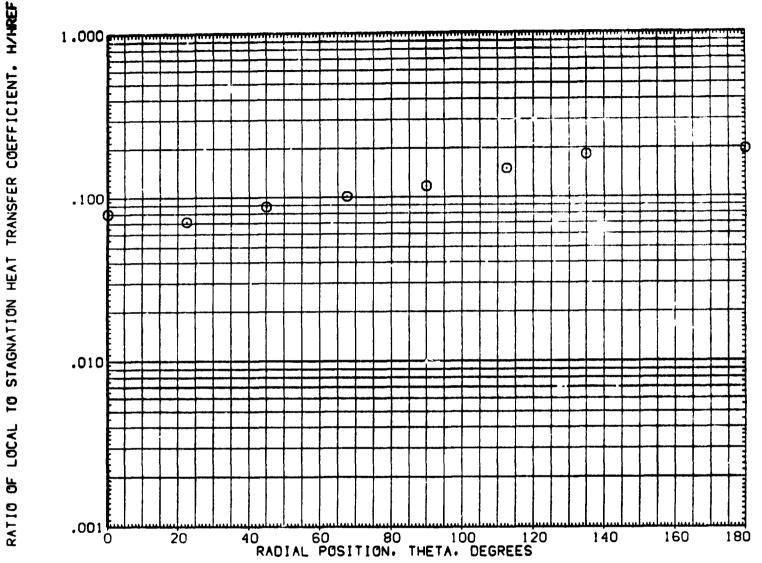


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP.RN/L=1.5)
PAGE 76

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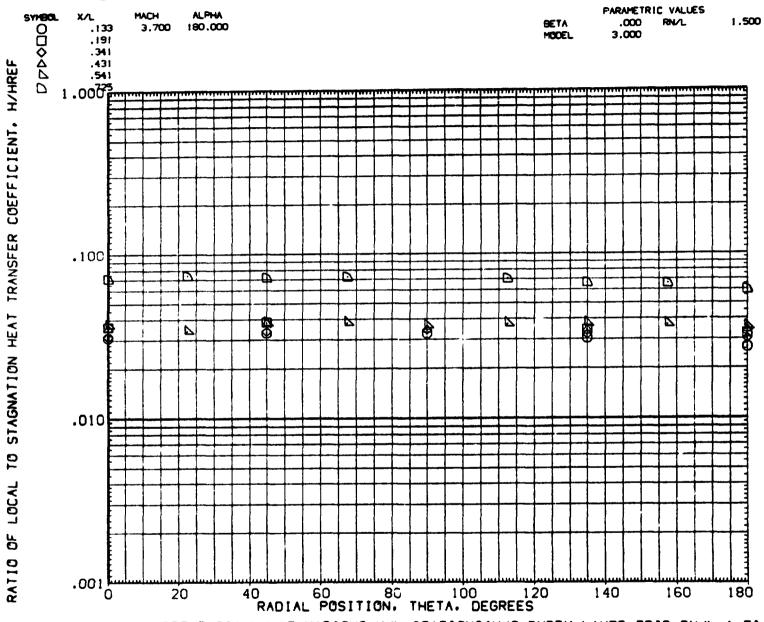


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP,RN/L=1.5)
PAGE 77

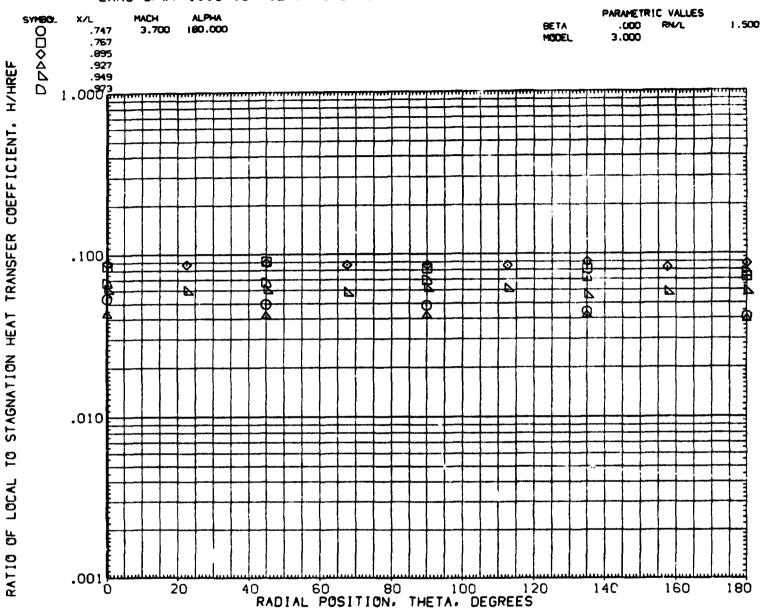


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=1.5)
PAGE 78

\_\_\_\_

 SYMBOL
 Y/L
 MACH
 ALPHA
 PARAMETRIC VALUES

 O
 .981
 3.700
 180.000
 807A
 .000
 RN/L
 1.500

 MODEL
 3.000

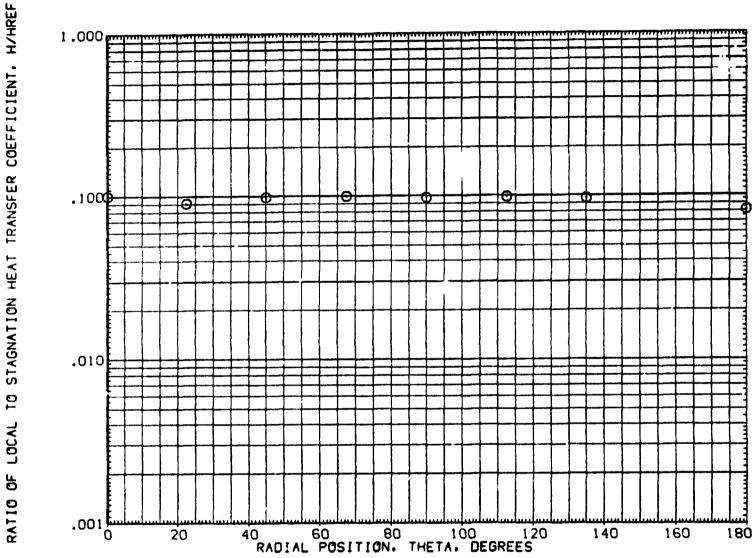


FIGURE 9 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=1.5)
PAGE 79

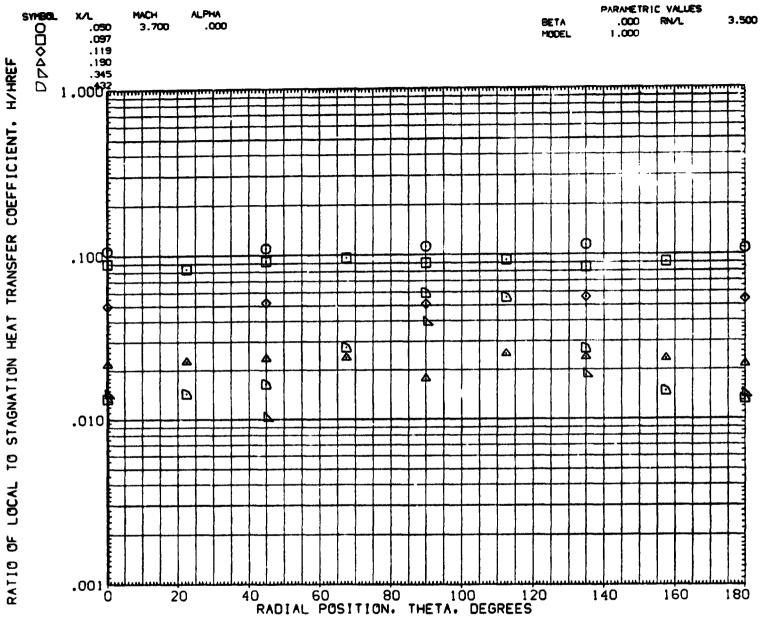
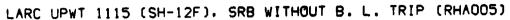


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=3.5)
PAGE 80

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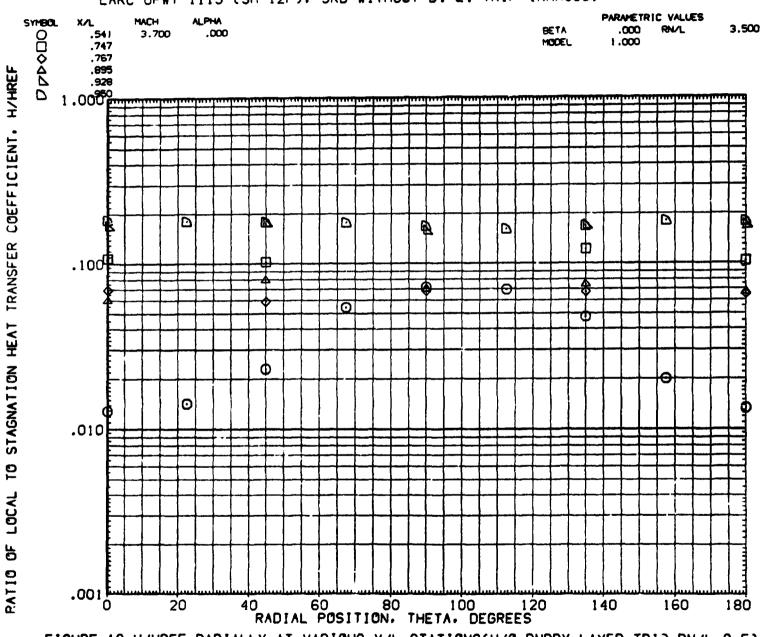
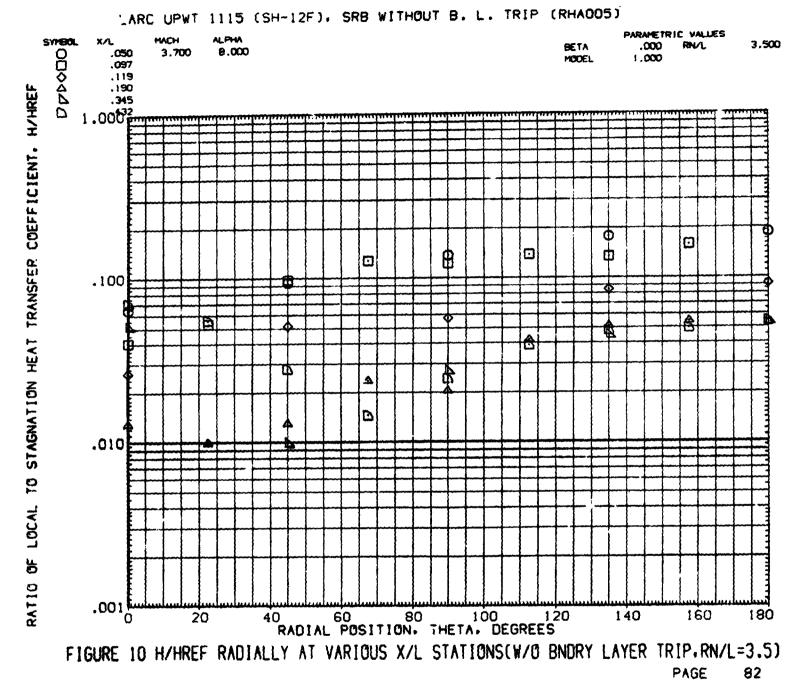


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=3.5)



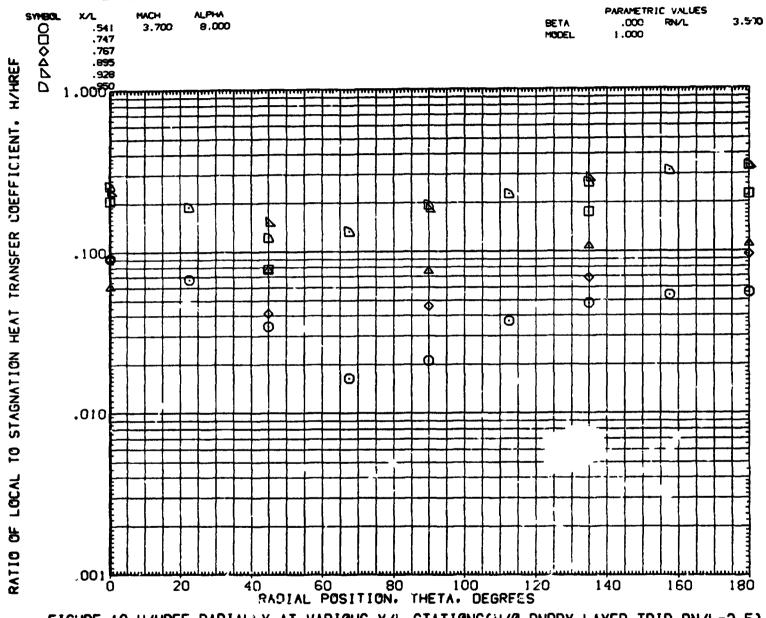


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=3.5)
PAGE 83

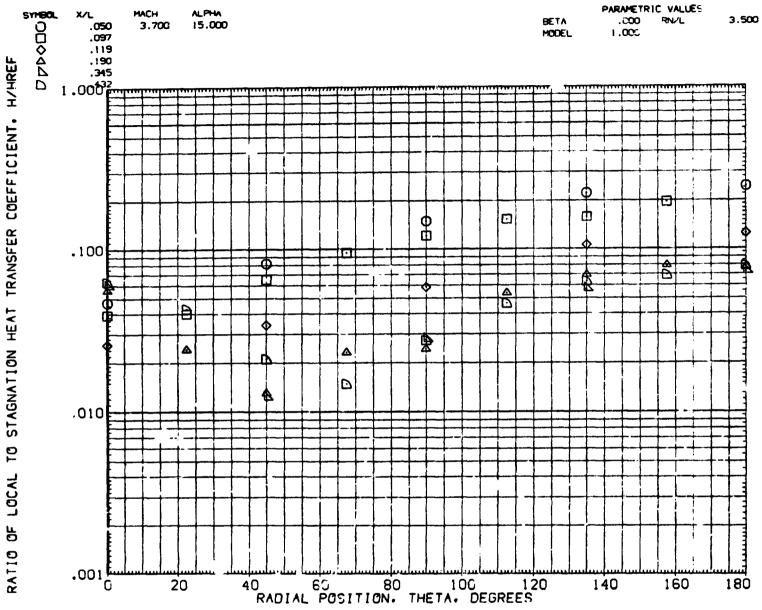


FIGURE 10 H/HREF RADIALLY AT VAKIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=3.5)
PAGE 84

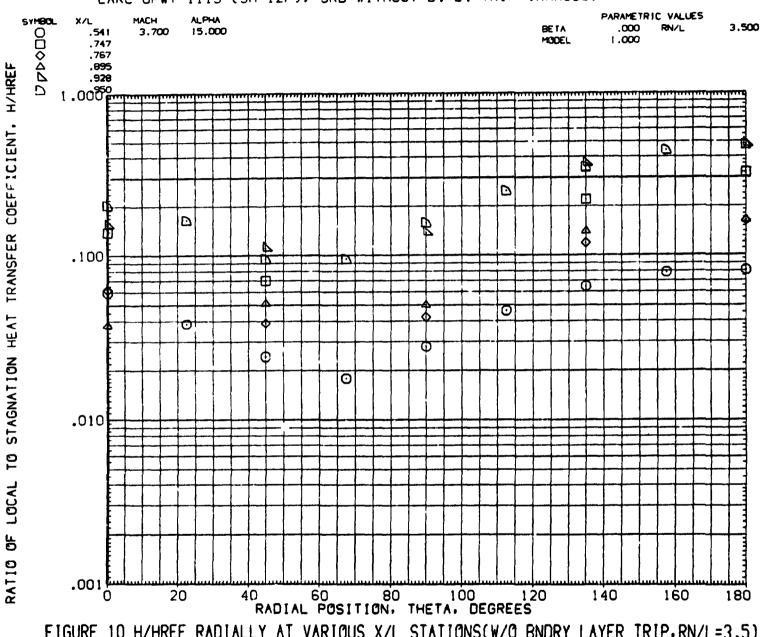


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP,RN/L=3.5)
PAGE 85

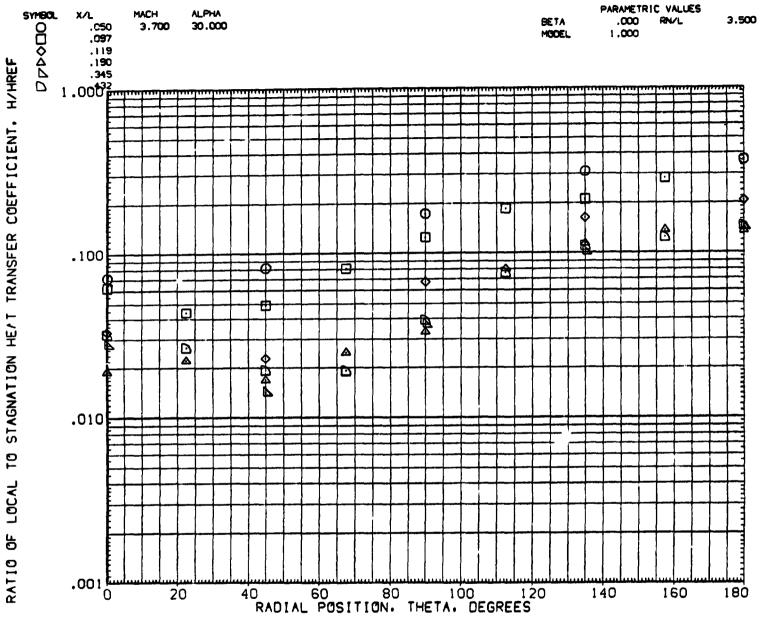


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP.RN/L=3.5)
PAGE 86

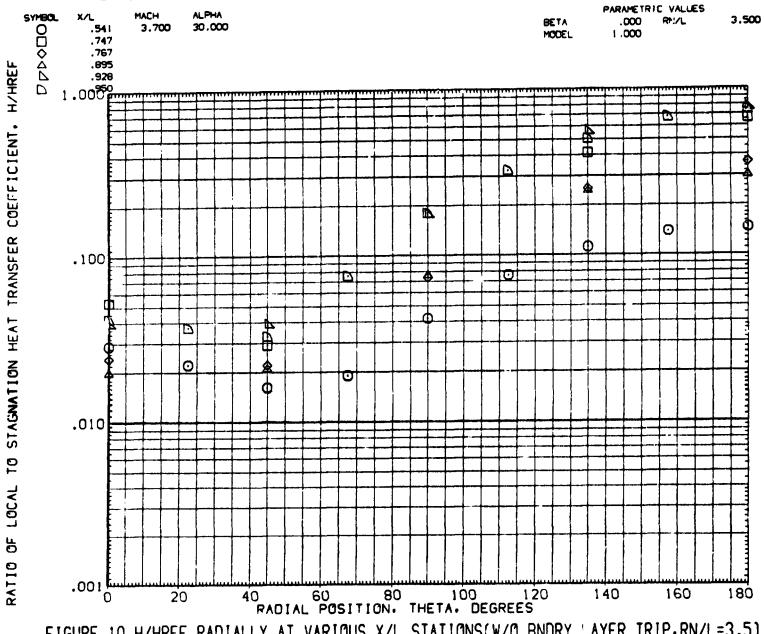


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP,RN/L=3.5)
PAGE 87

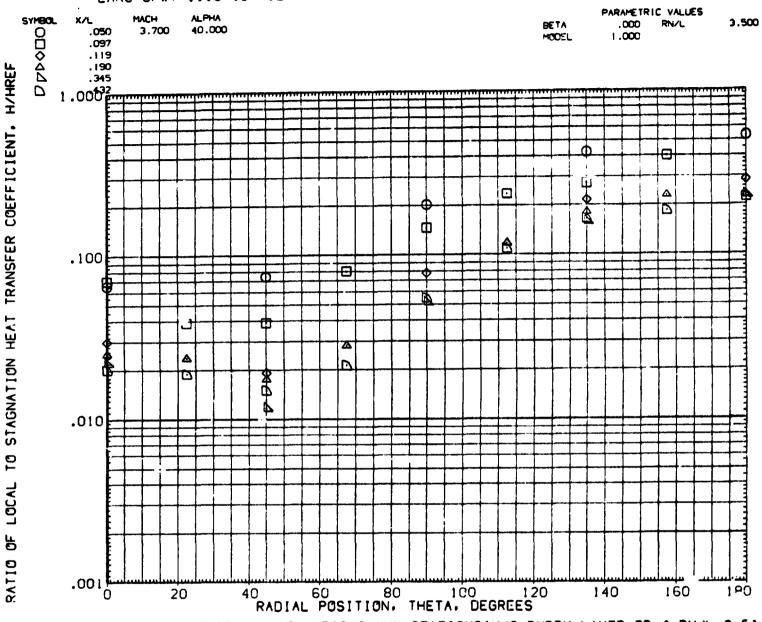


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP.RN/L-7.5)

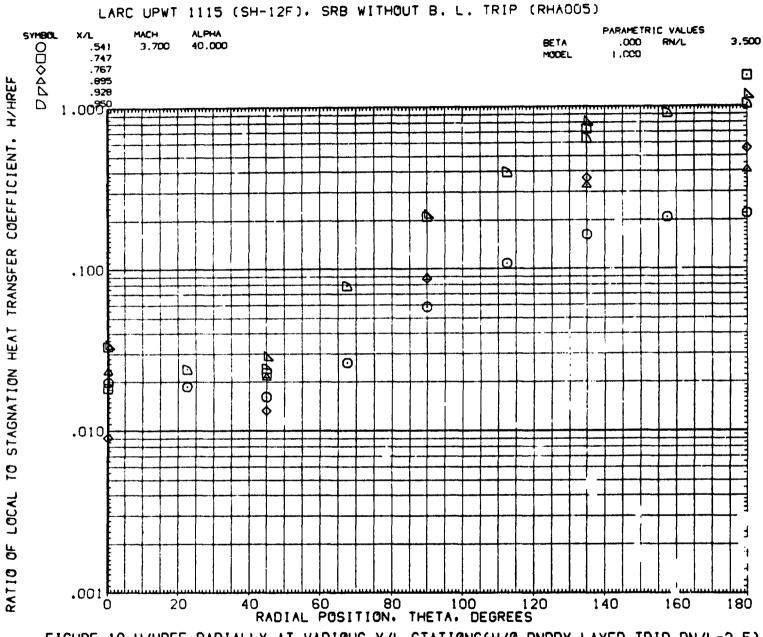


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP,RN/L=3.5)

PAGE 89

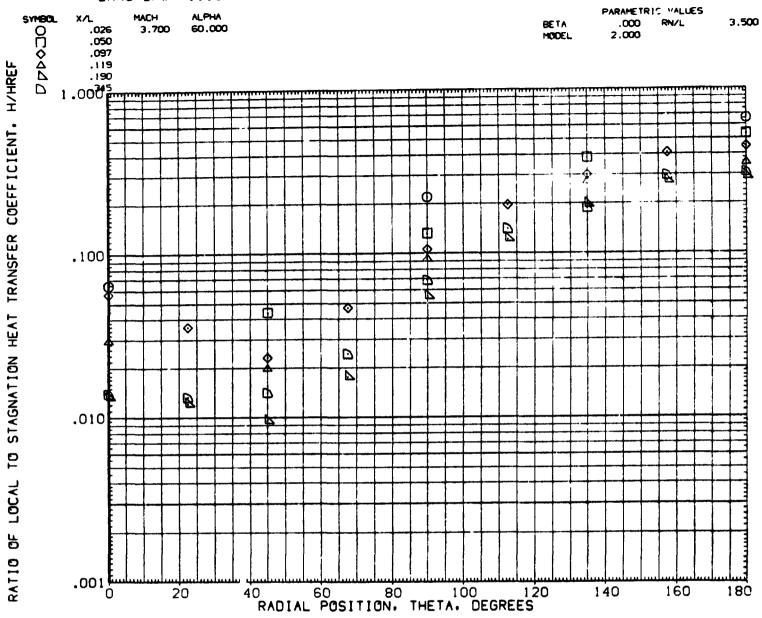


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=3.5)
PAGE 90

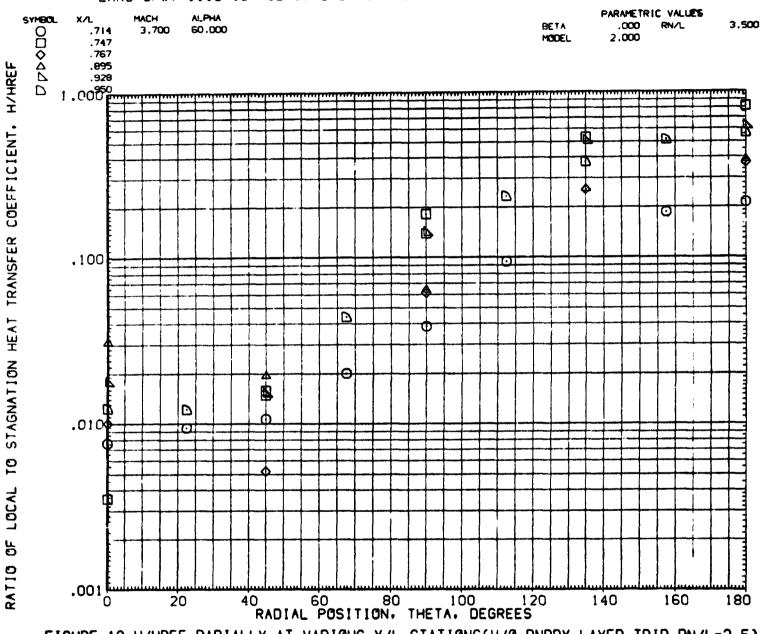


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=3.5)
PAGE 91

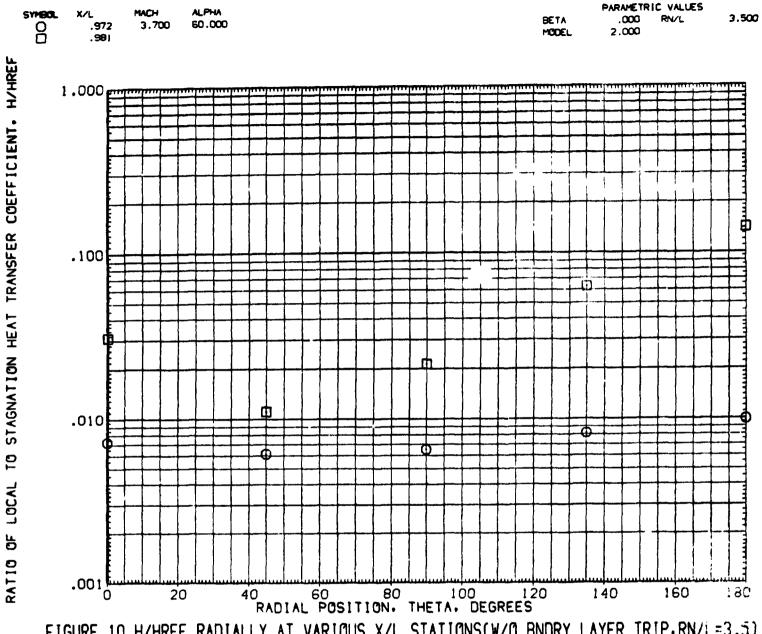


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP.RN/L=3.5)
PAGE 92

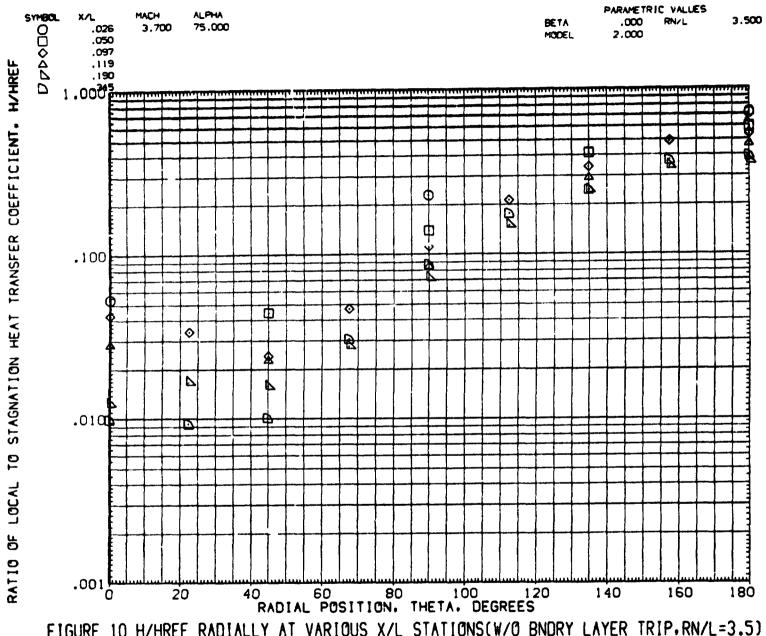


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=3.5)

PAGE 93

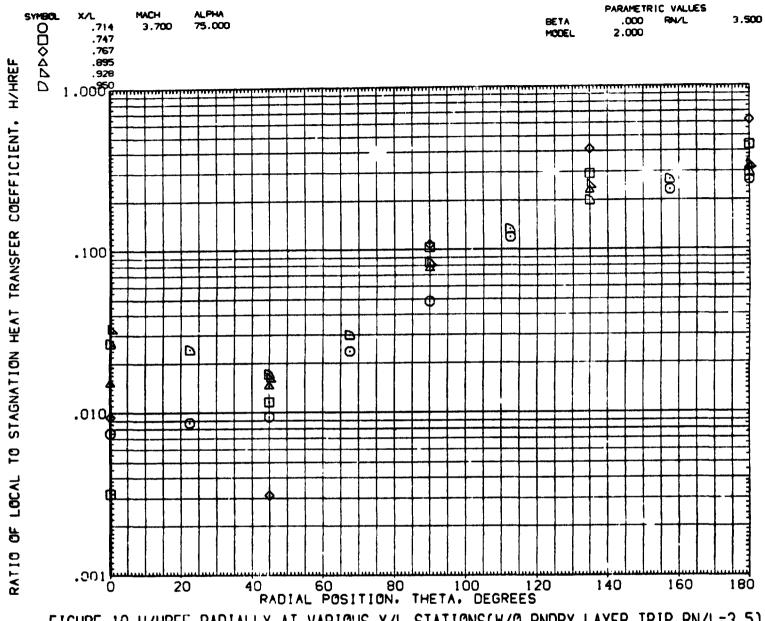
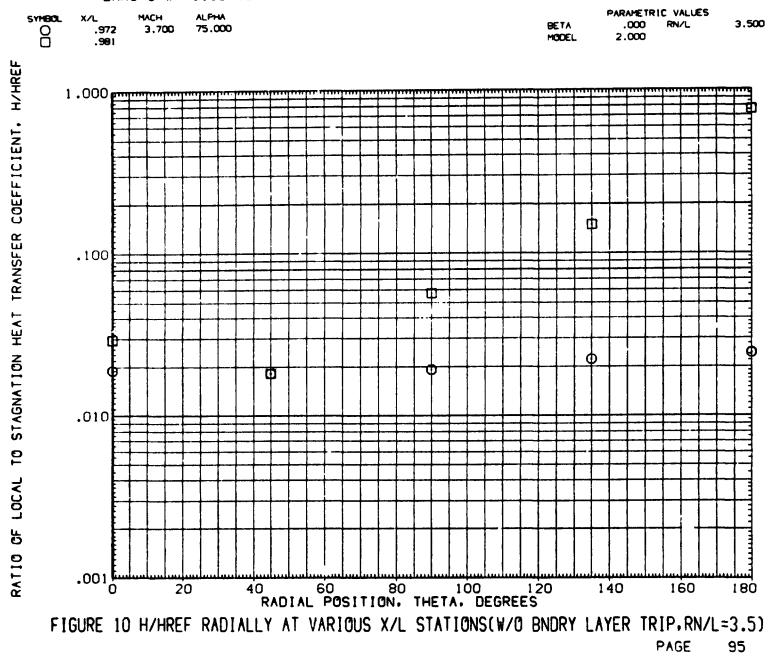


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=3.5)
PAGE 94



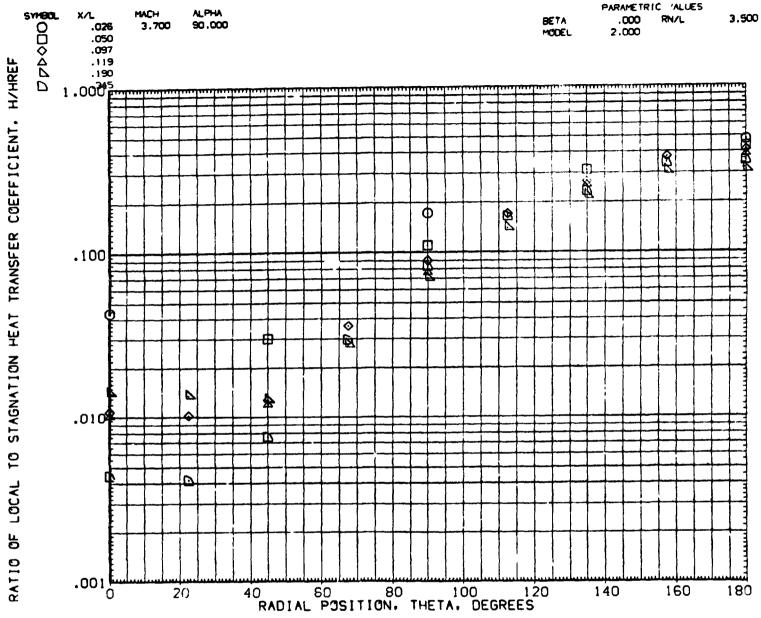


FIGURE 10 H/HREF RADIALLY AT VARIOUS A/L STATIONS(W/O BNDRY LAYER TRIP.RN/L=3.5)
PAGE 96

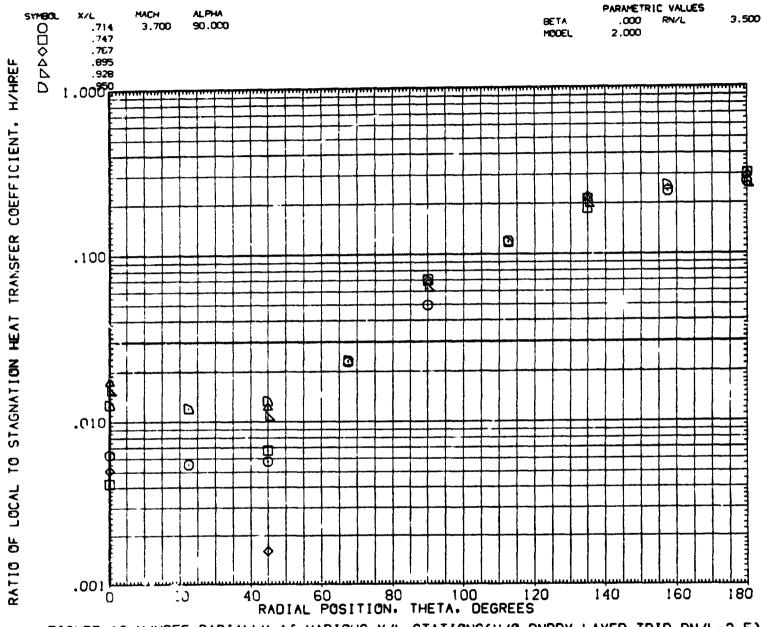
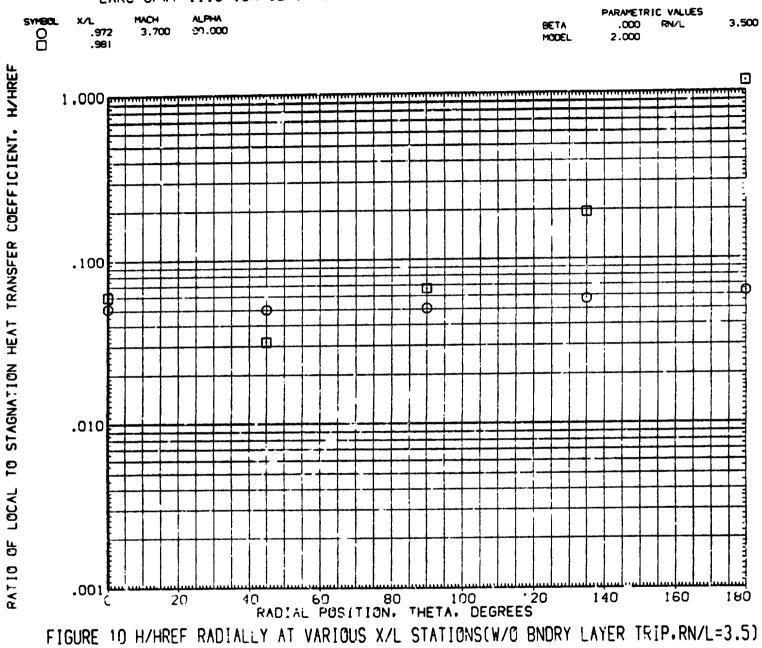


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, PN/L=3.5)
PAGE 97



98 PAGE

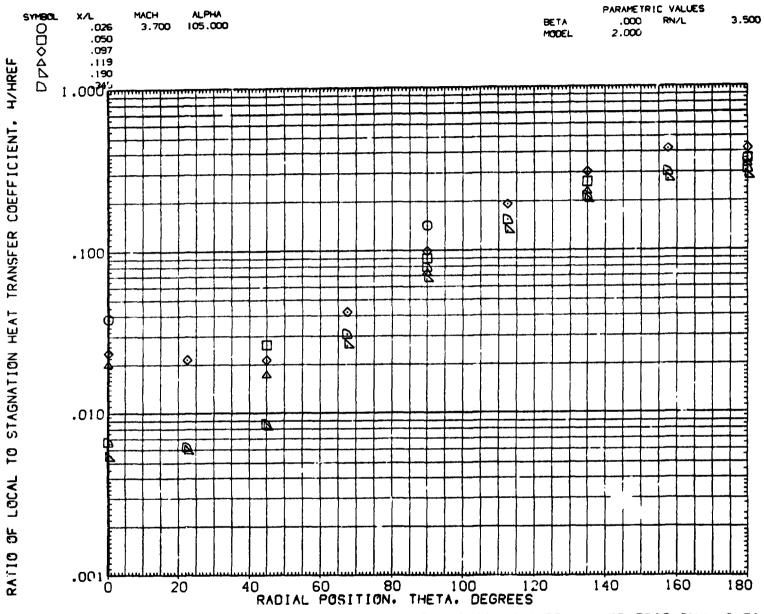


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP.RN/L=3.5)
PAGE 99

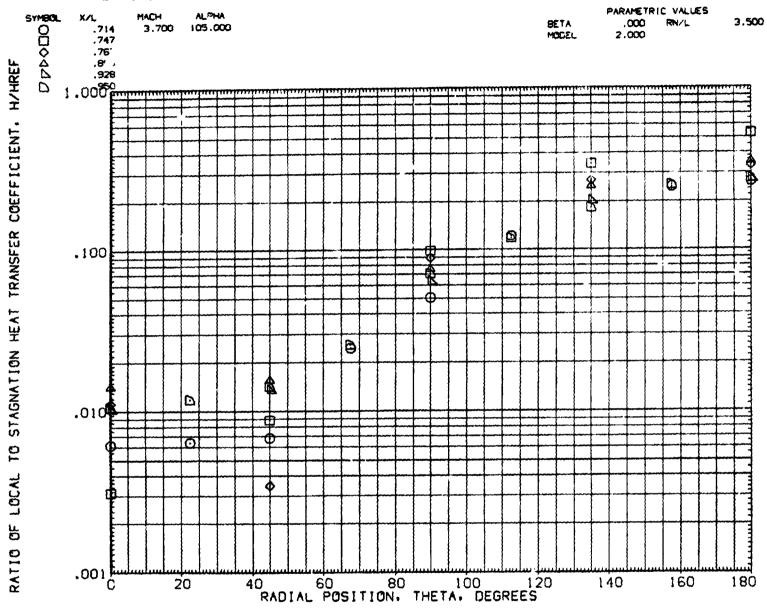
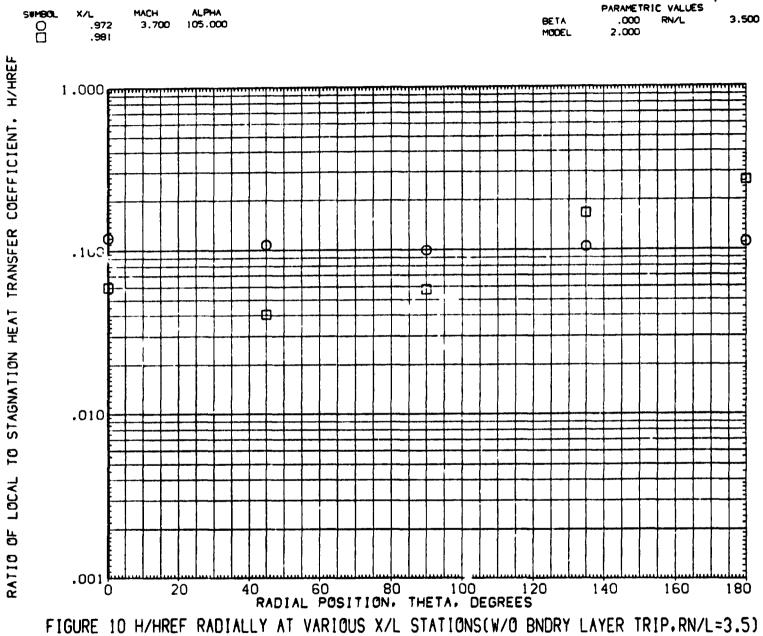


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP.RN/L=3.5)



PAGE 101

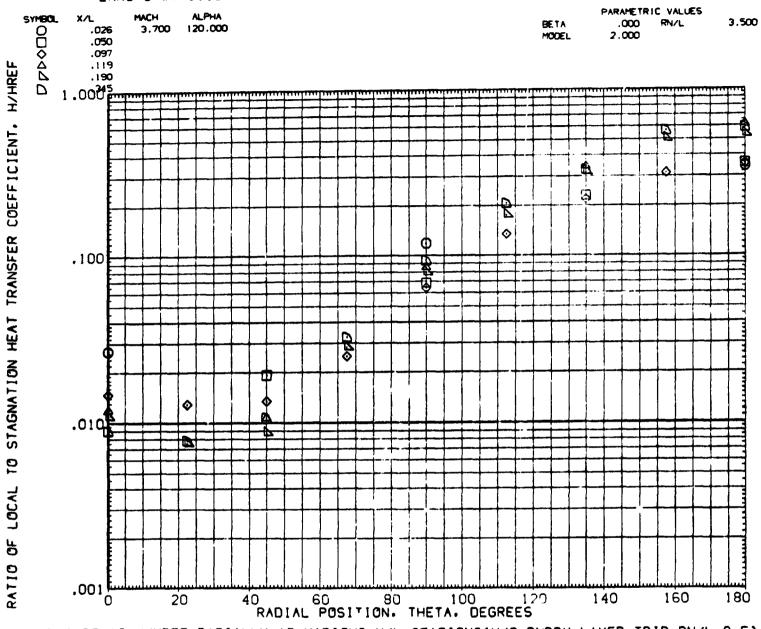


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=3.5)
PAGE 102

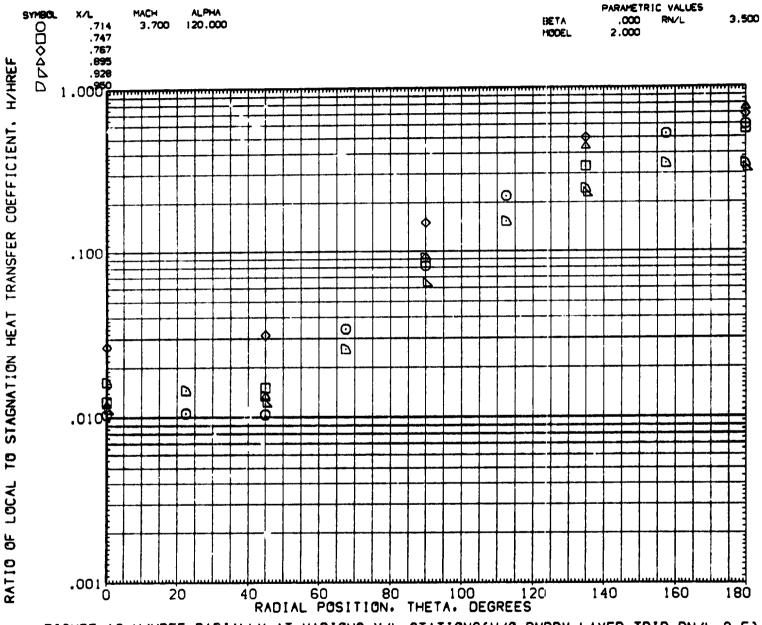


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=3.5)

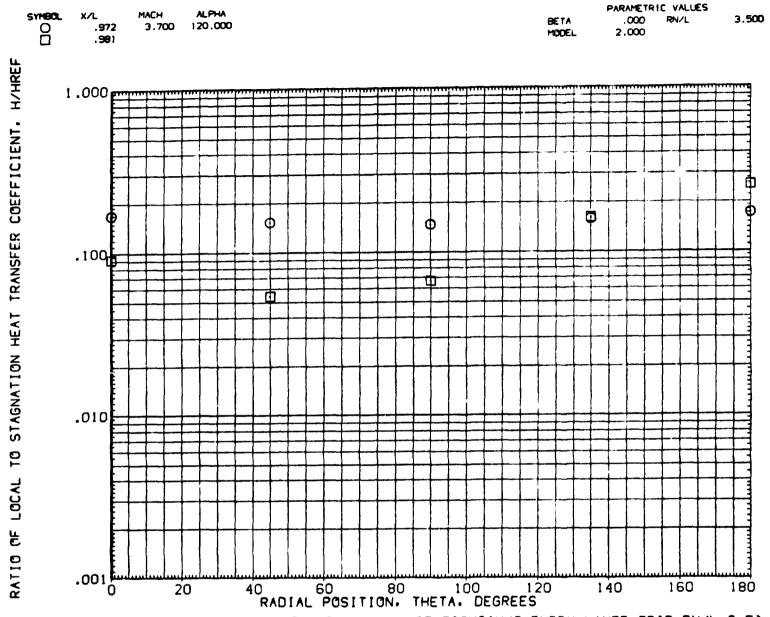


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=3.5)
PAGE 104

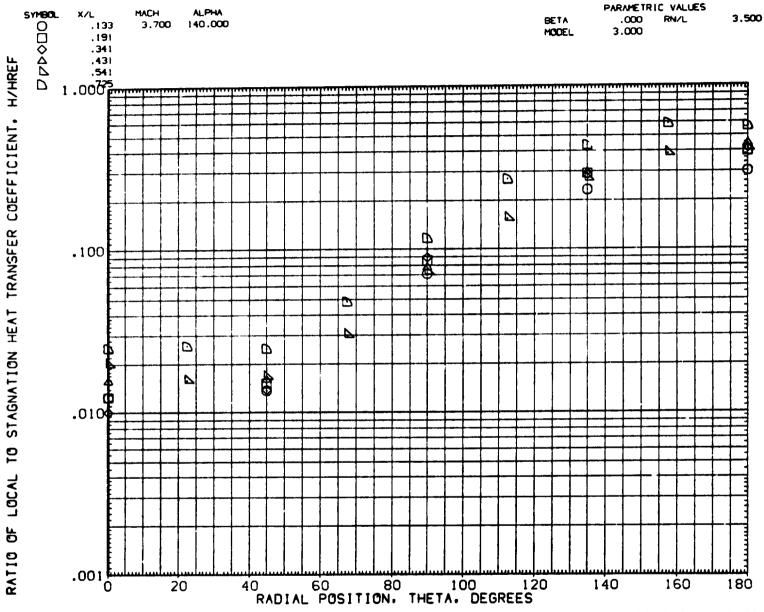


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP.RN/L=3.5)
PAGE 105

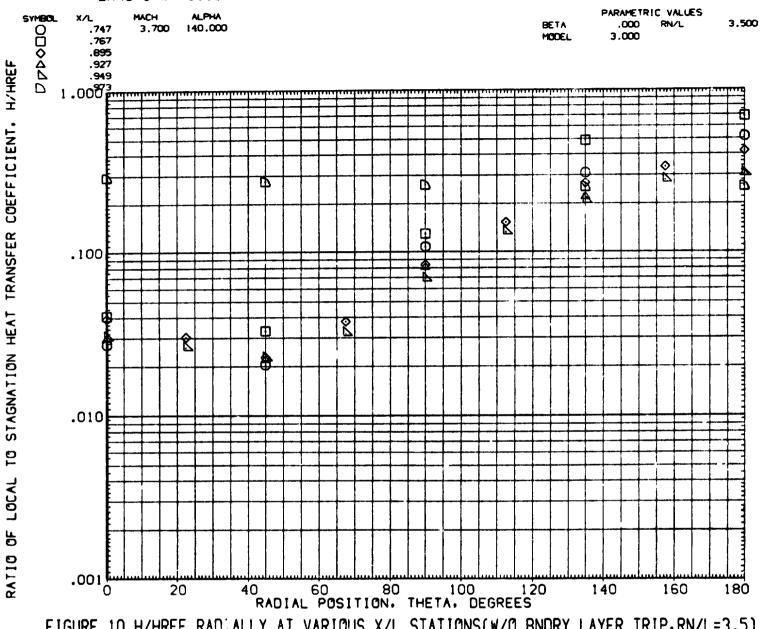


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP.RN/L=3.5)
PAGE 106

LARC UPWT 1115 (SH-12F), SRB WITHOUT B. L. TRIP (RHA010)



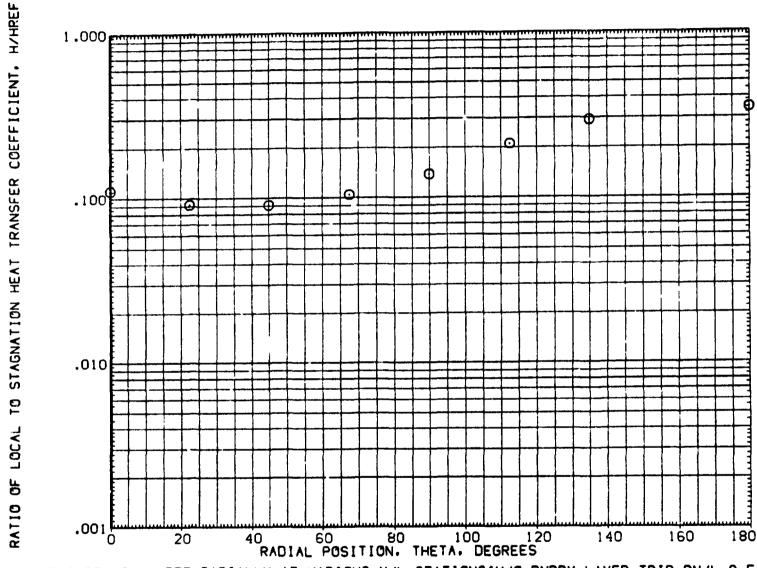


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP,RN/L=3.5)
PAGE 107

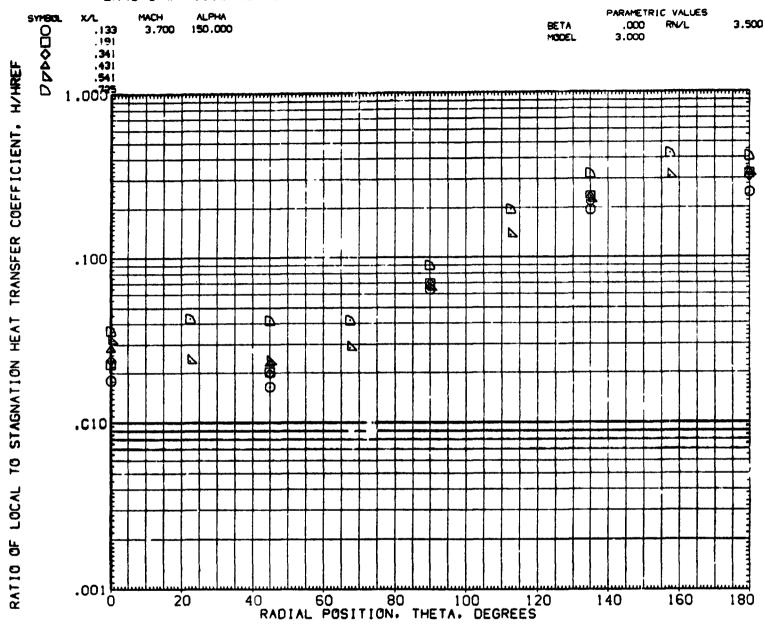


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=3.5)

PAGE 108

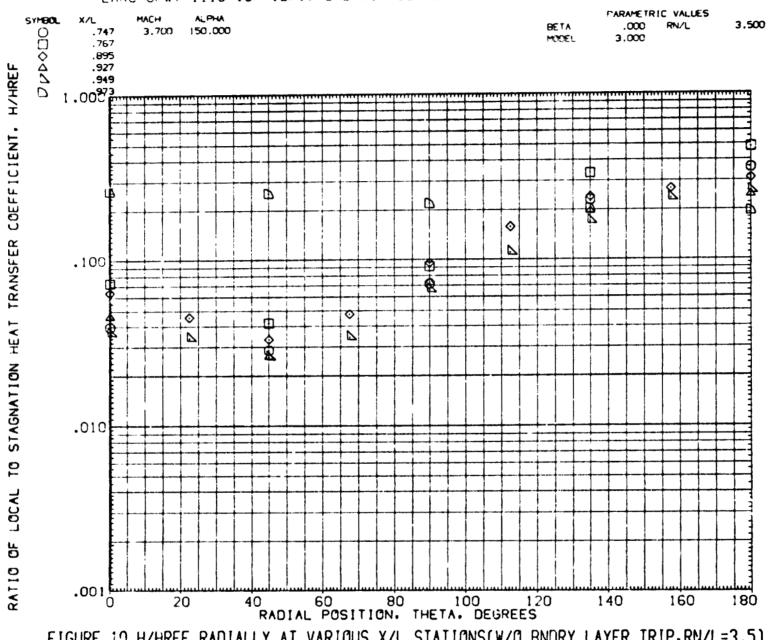


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP,RN/L=3.5)

PAGE 109

SYMBOL X/L MACH ALPHA

O .981 3.700 150.000

PARAMETRIC VALUES

BETA .000 RN/L J.500

MODEL 3.000

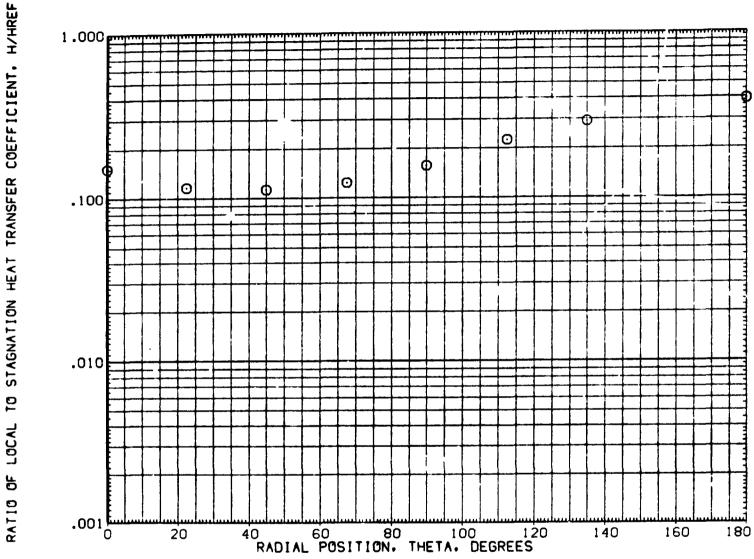
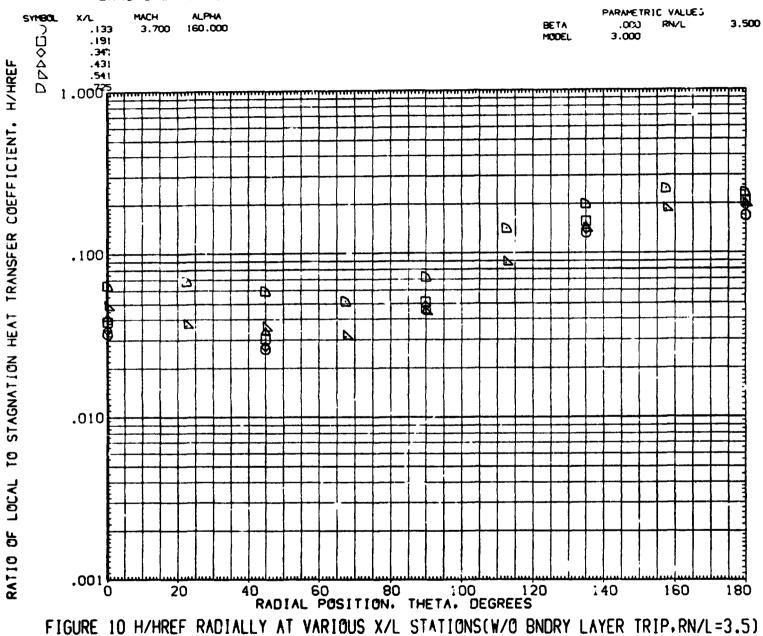


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=3.5)
PAGE 1:0



PAGE 111

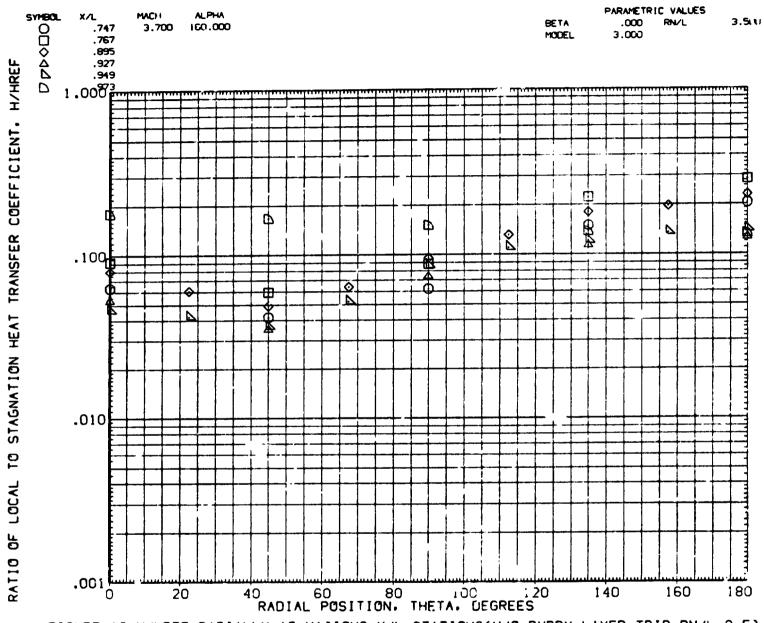


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=3.5)
PAGE 112



LARC UPWT 1115 (SH-12F). SRB WITHOUT B. L. TRIP (RHA010)

 SYMBOL X/L
 MACH
 ALPHA
 PARAMET TO VALUES

 O
 .981
 3,700
 160,000
 8ETA
 .000
 RN/L
 3,500

 MODEL
 3,000

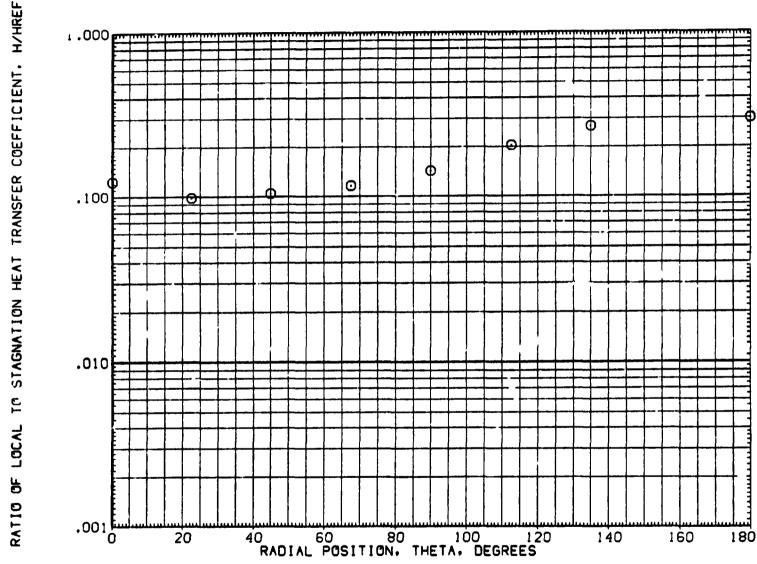


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP.RN/L=3.5)
PAGE 113

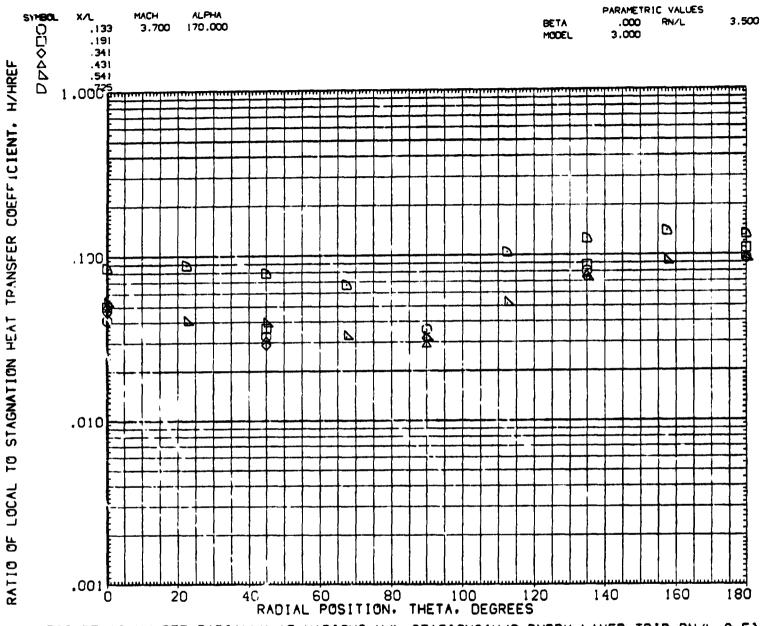


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=3.5)
PAGE 114



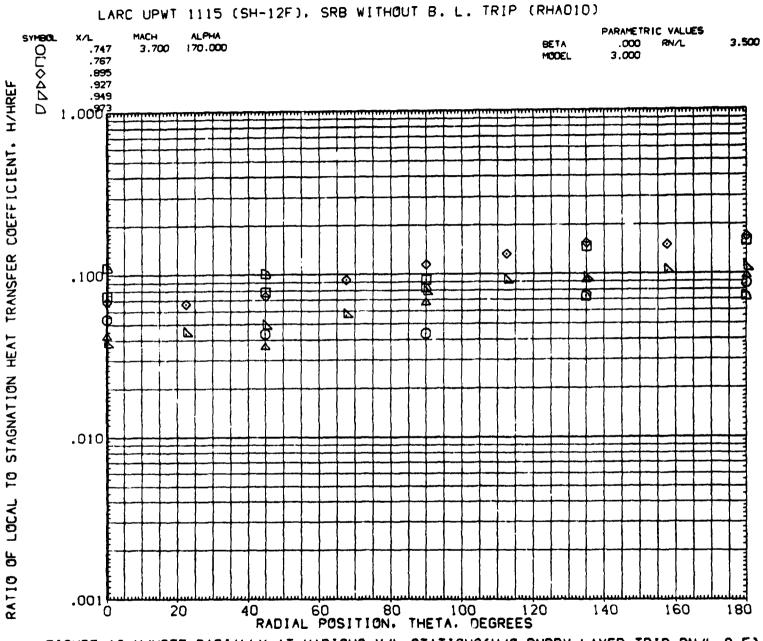


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(\(\frac{1}{2}\)/O BNDRY LAYER TRIP.RN/L=3.5)

 SYMBOL
 X/L
 MACH
 ALPHA
 PARAMETRIC VALUES

 O
 .981
 3.700
 170.000
 BETA
 .000
 RN/L
 3.500

 MODEL
 3.000

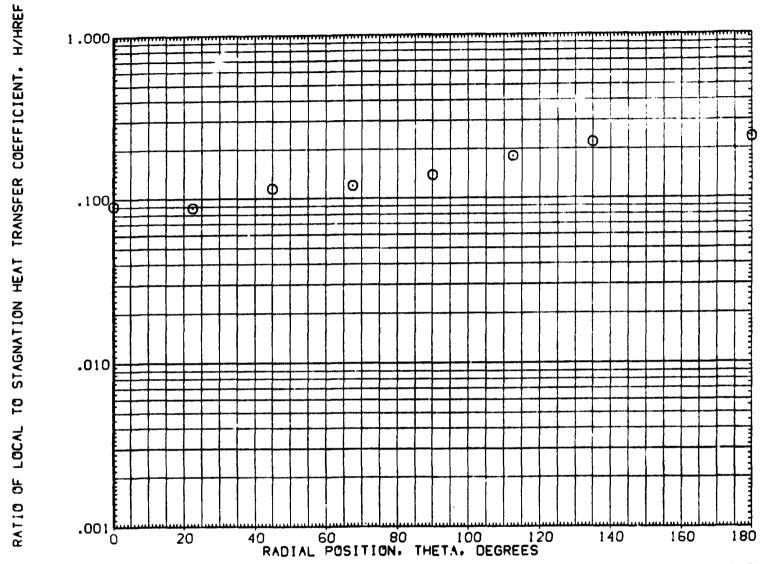


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP.RN/L=3.5)
PAGE 116

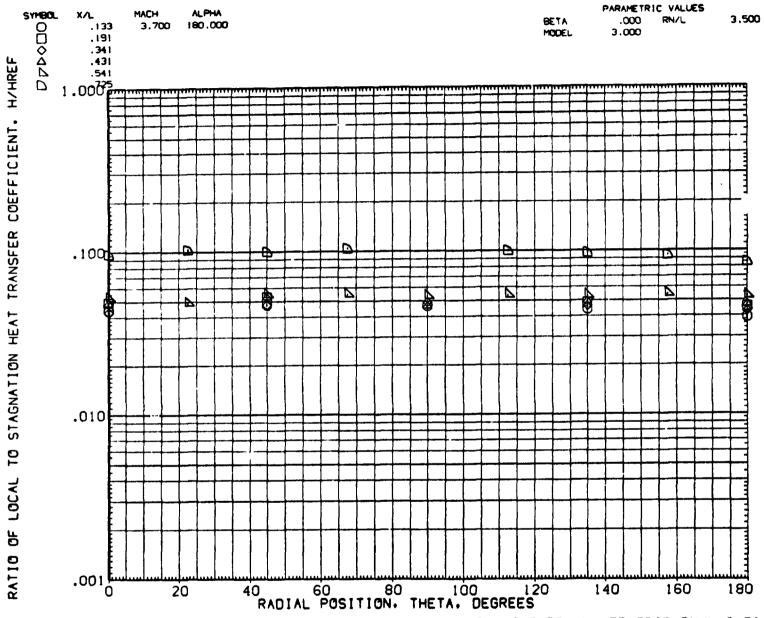


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP, RN/L=3.5)
PAGE 117

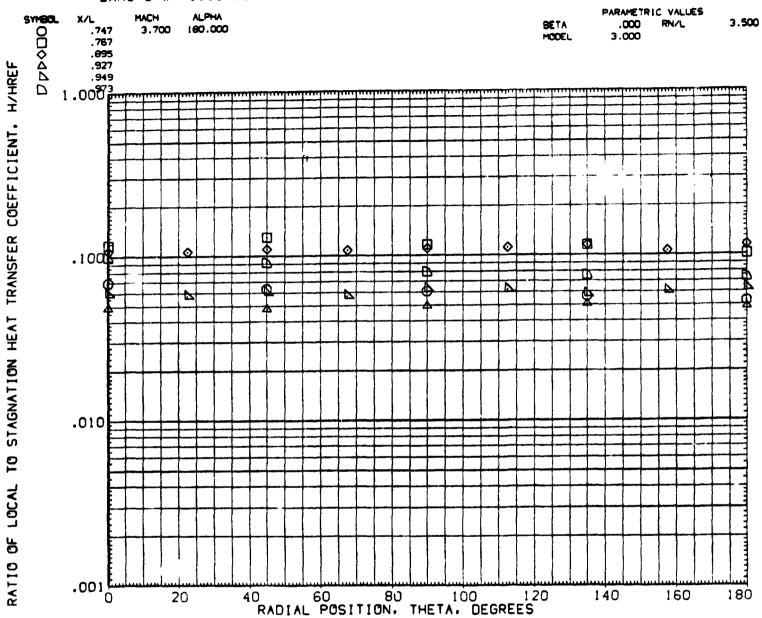


FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP.RN/L=3.5)
PAGE 118

LARC UPWT 1115 (SH-12F), SRB WITHOUT B. L. TRIP (RHA010)

PARAMETRIC VALUES

SYMBOL X/L 3,500 BETA ,000 3.700 190.000 0 .981 MODEL 3.000 LOCAL TO STAGNATION HEAT TRANSFER COEFFICIENT. H/HREF 1.000 pm .100 .010 RATIO OF .001 Fin 40 60 80 100 12 RADIAL POSITION, THETA, DEGREES 120 20 140 160 180

FIGURE 10 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP,RN/L=3.5)
PAGE 119

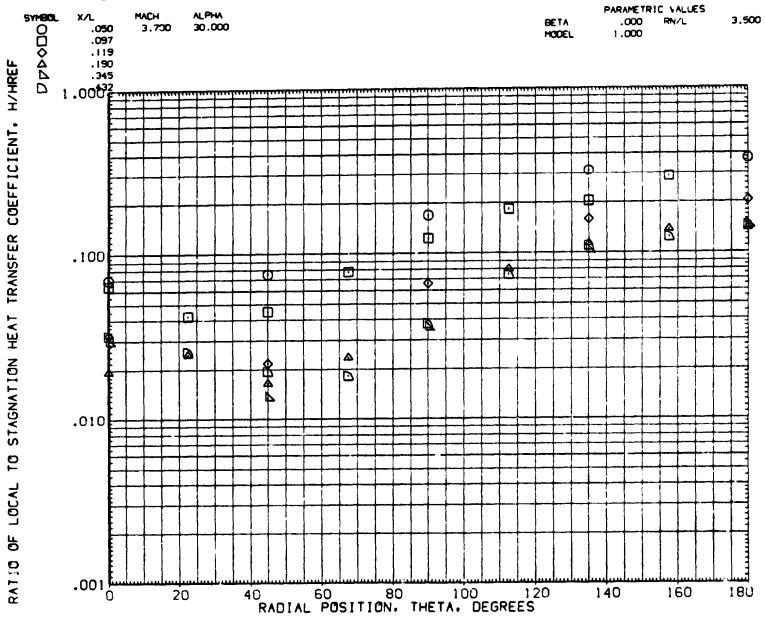


FIGURE 11 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP AND RING)
PAGE 120

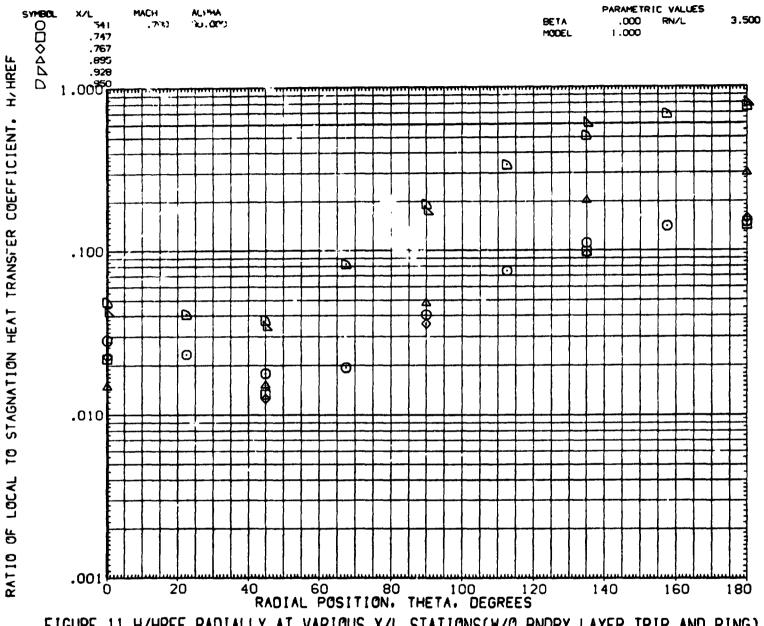


FIGURE 11 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP AND RING)
PAGE 121

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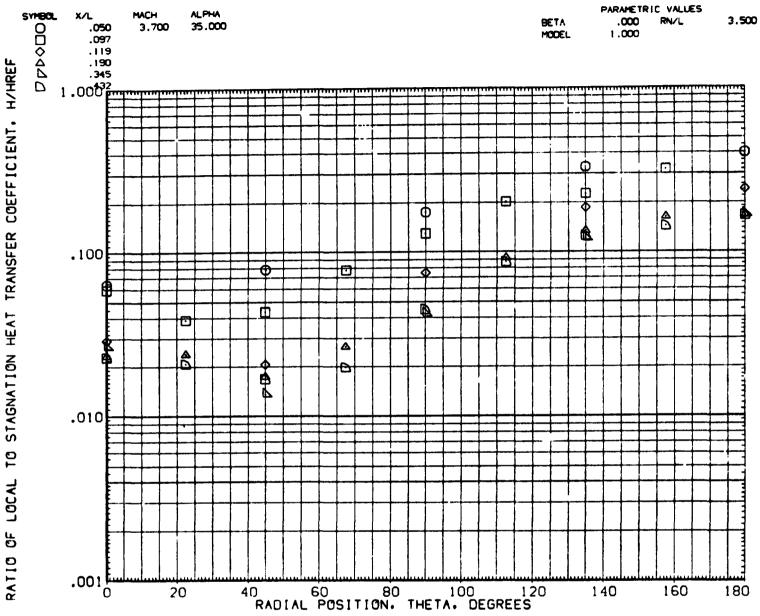
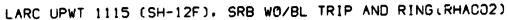


FIGURE 11 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP AND RING)
PAGE 122



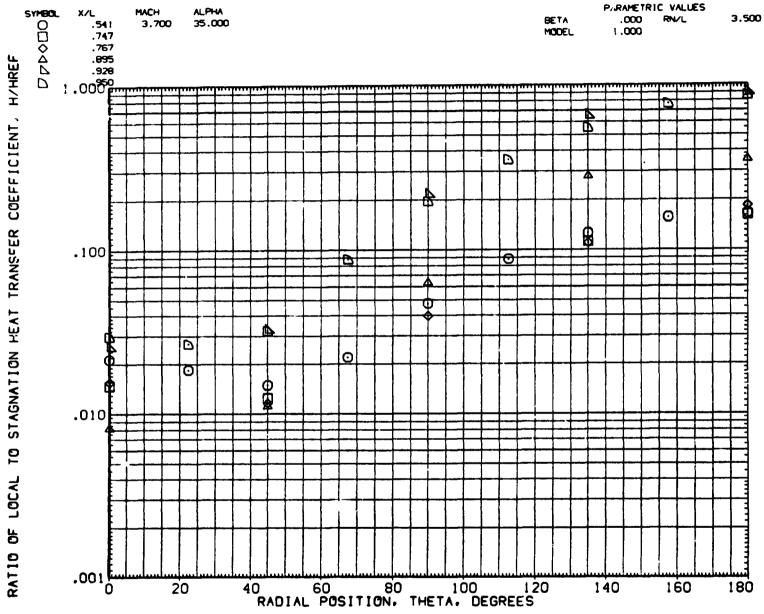


FIGURE 11 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP AND RING)
PAGE 123

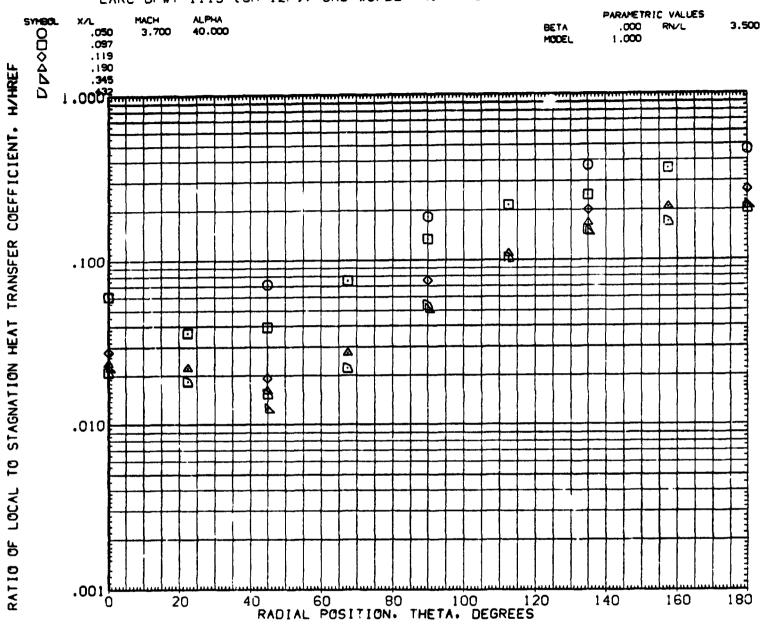


FIGURE 11 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP AND RING)
PAGE 124



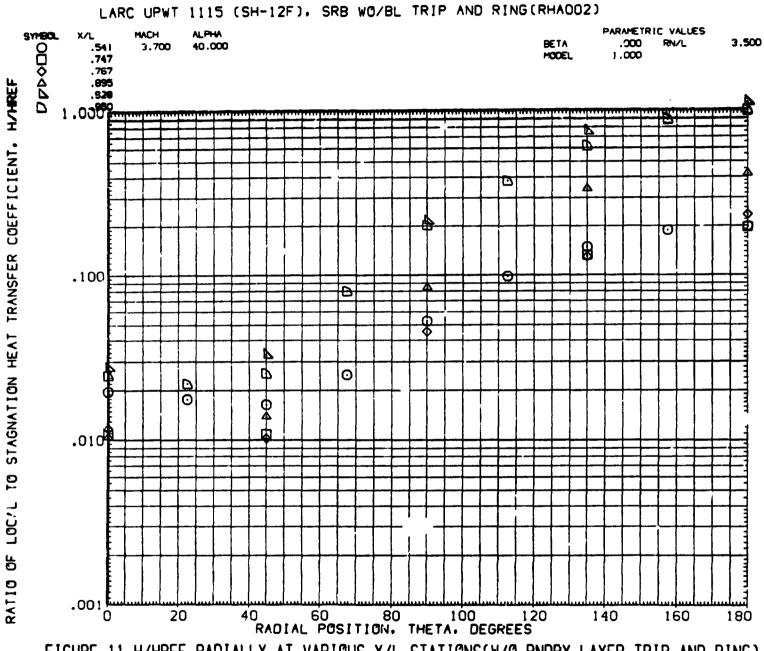


FIGURE 11 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP AND RING)
PAGE 125

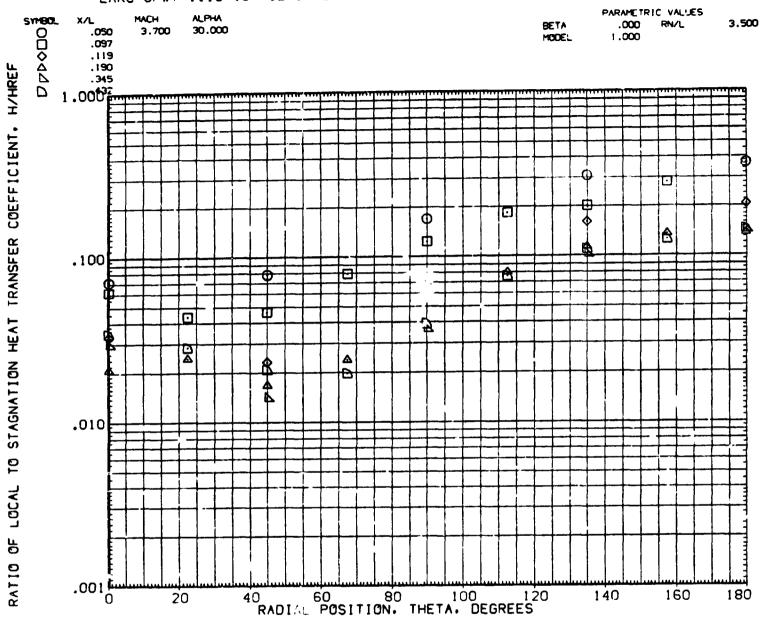


FIGURE 11 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TOTP AND RING)



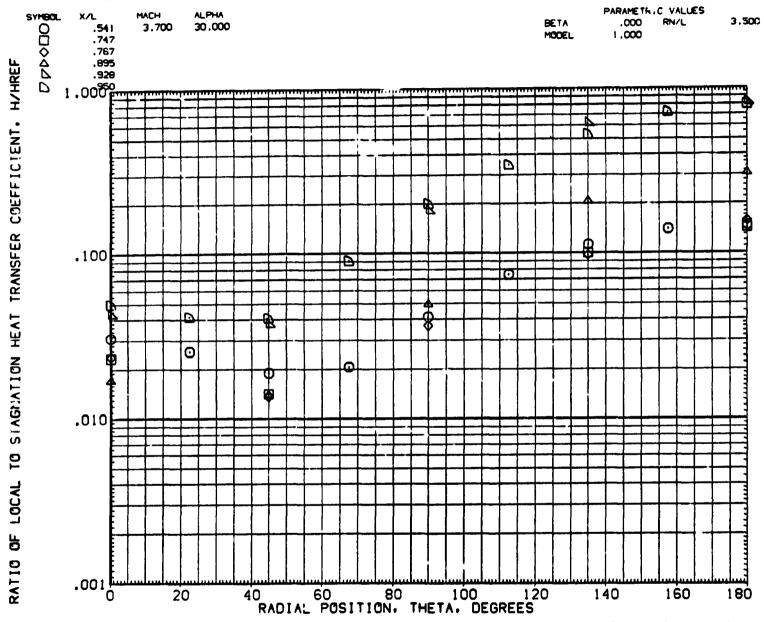


FIGURE 11 H/HREF RADIALLY AT VARIOUS X/L STATIONS(W/O BNDRY LAYER TRIP AND RING)
PAGE 127

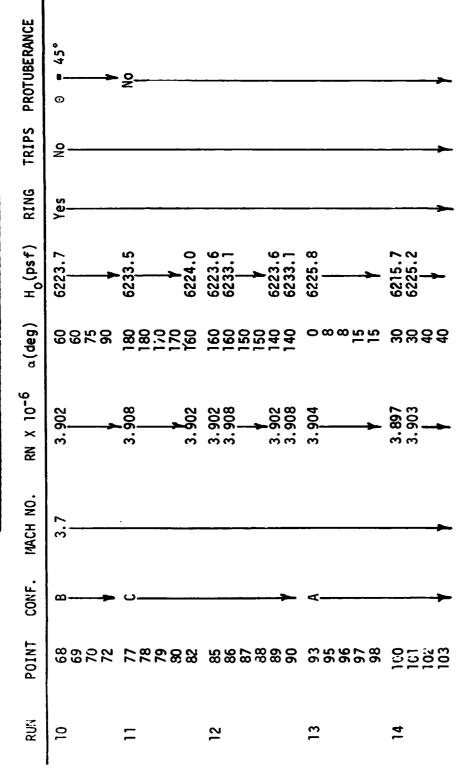
APPENDIX A
SCHLIEREN PHOTOGRAPHS

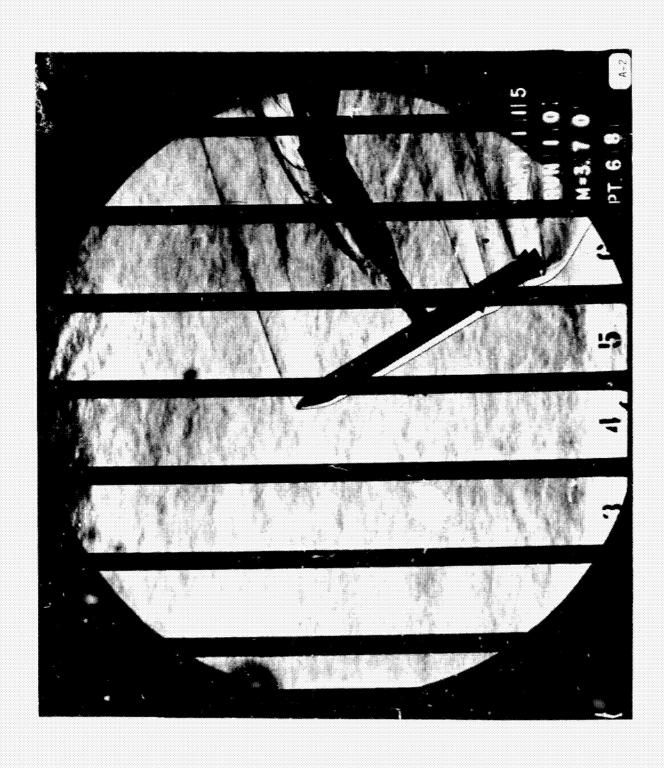
TABLE A-I

NASA - LANGLEY

0.013-SCALE SRB MODEL (SH-12F)

HEAT TRANSFER TESTS - UPWT PROJECT 1115

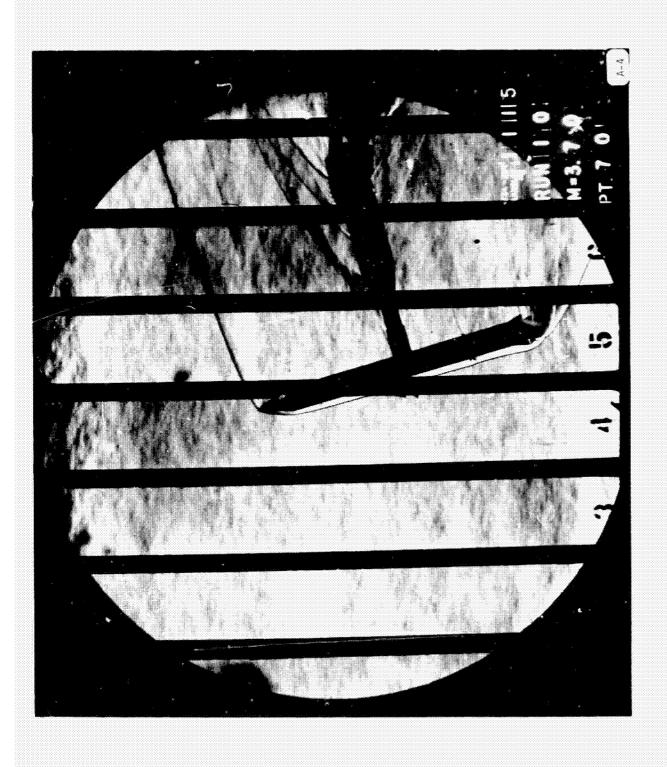


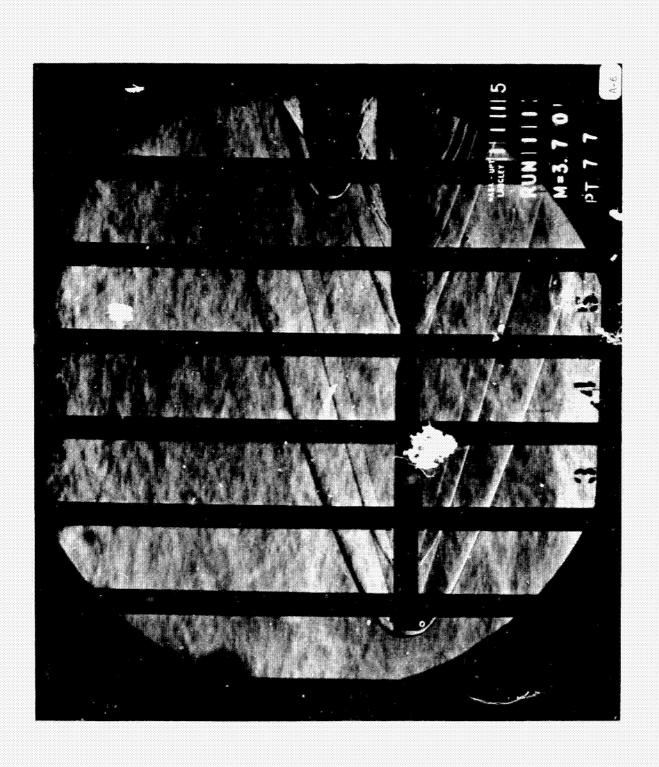


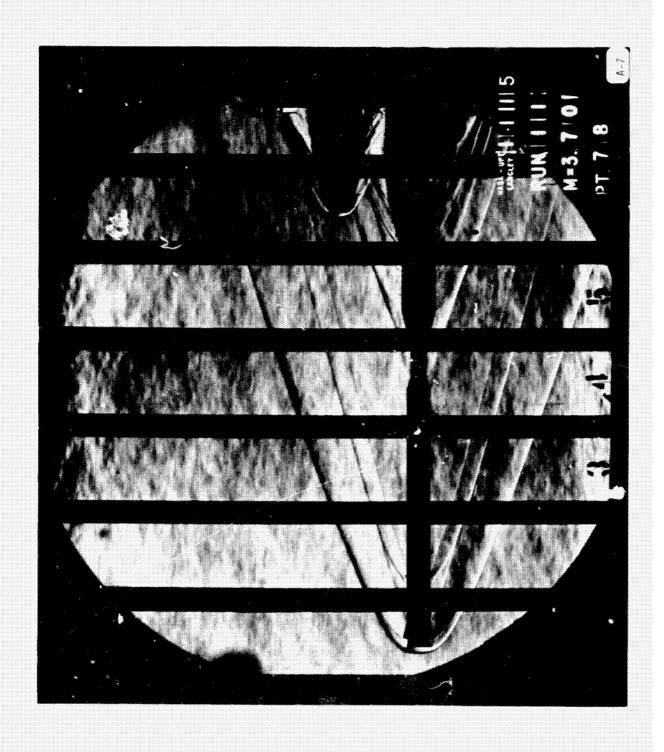
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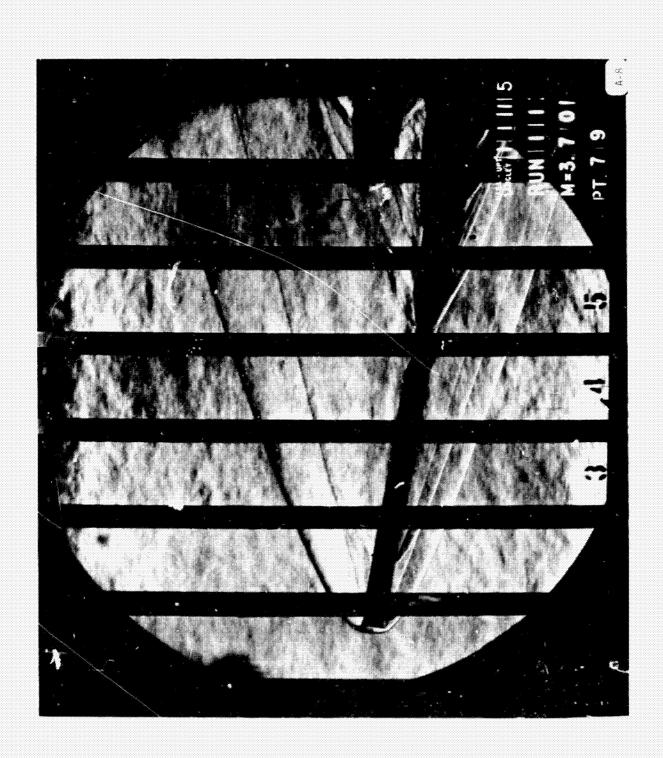


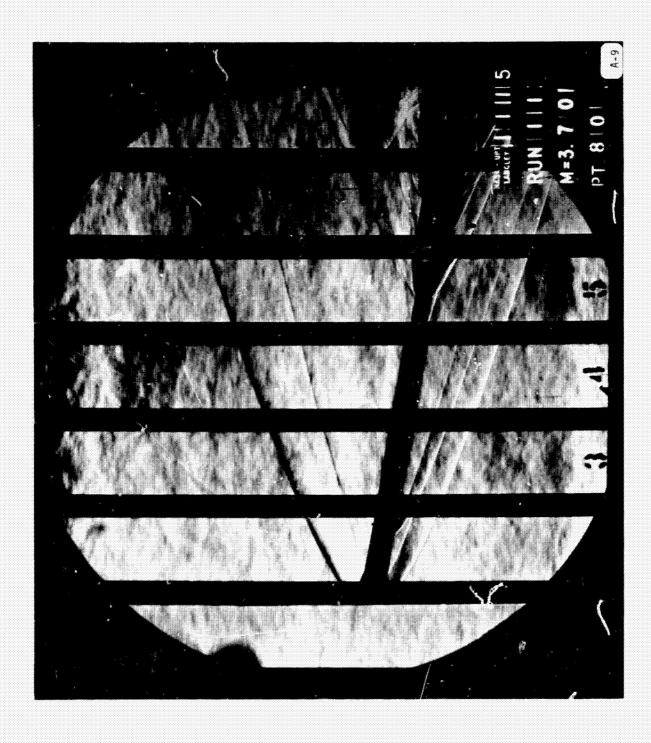
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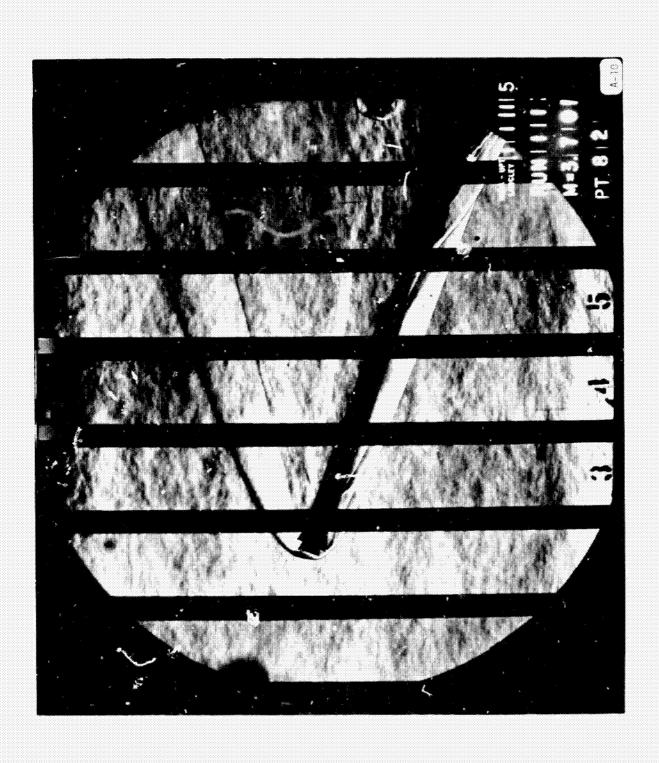


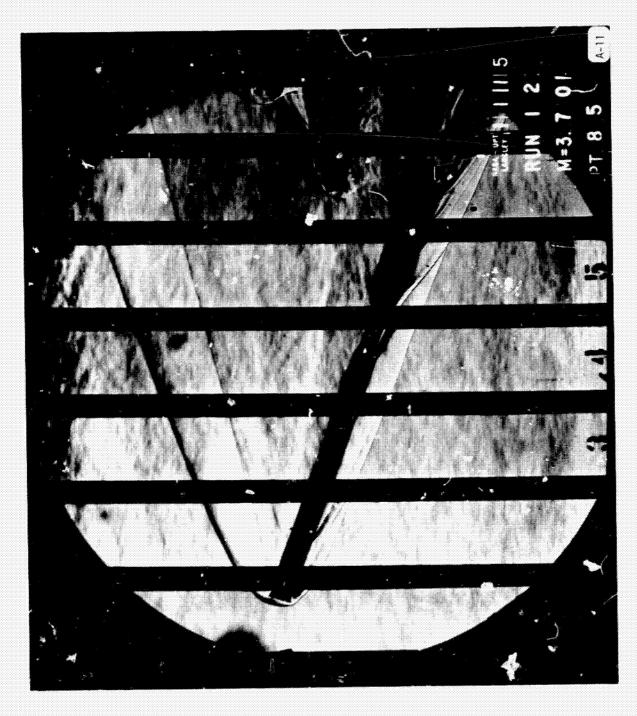




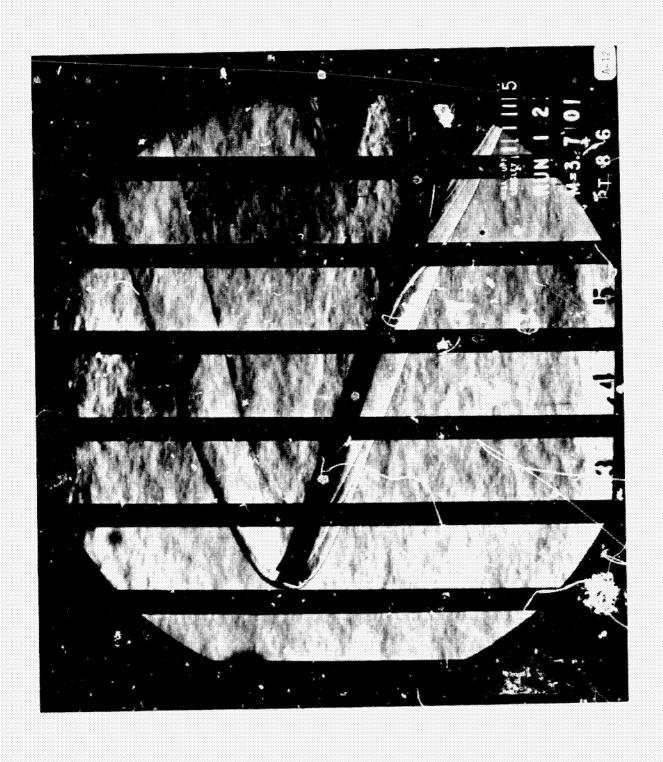


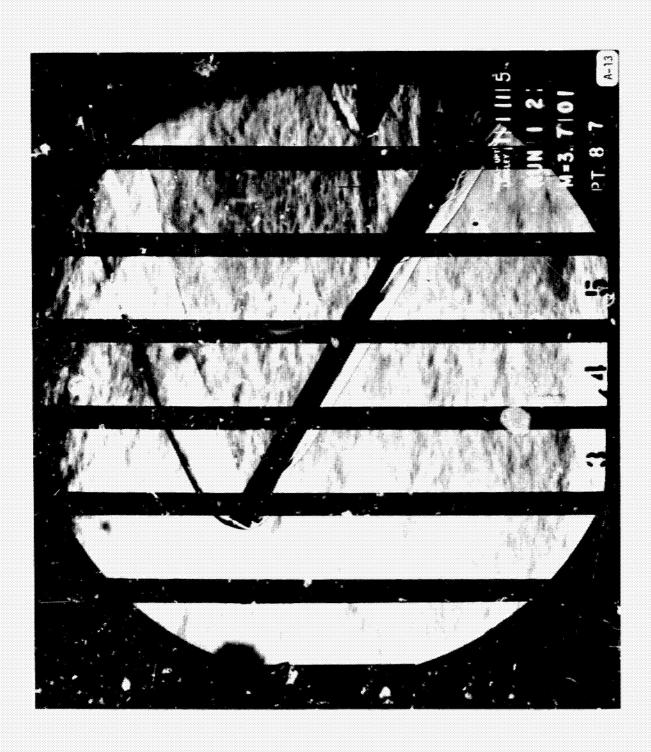


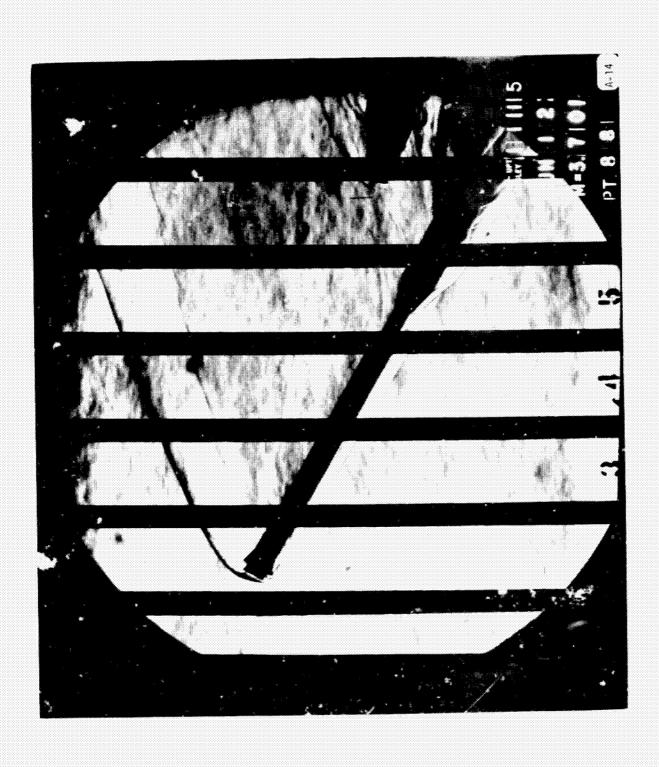


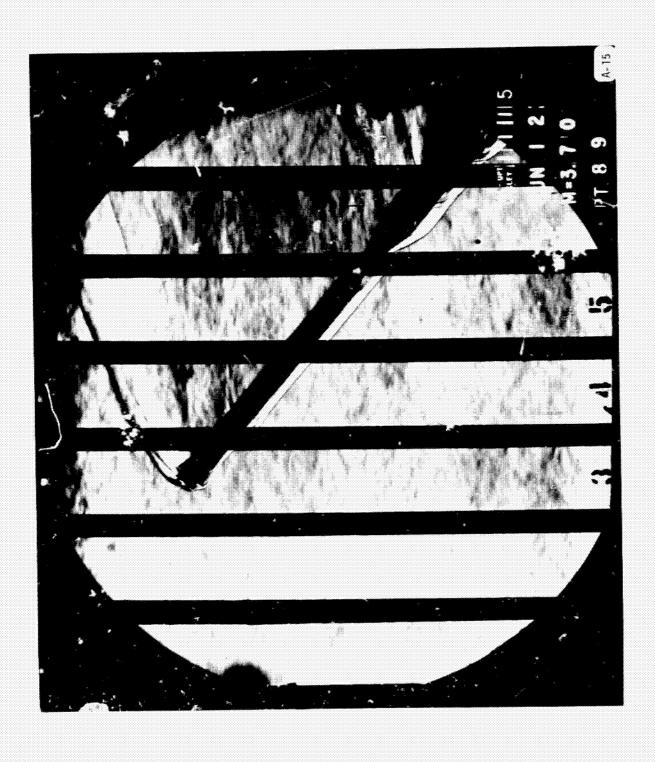


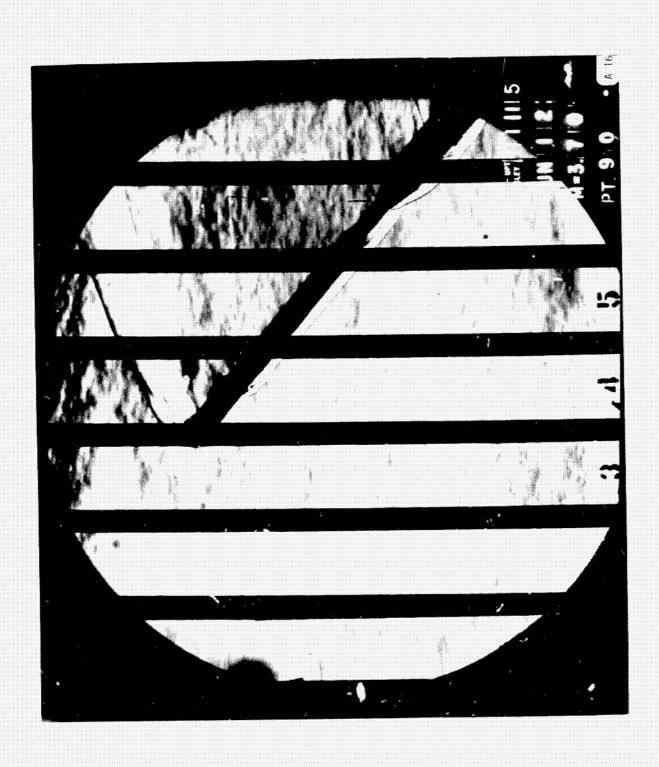
Zindir i dan Ki Millian

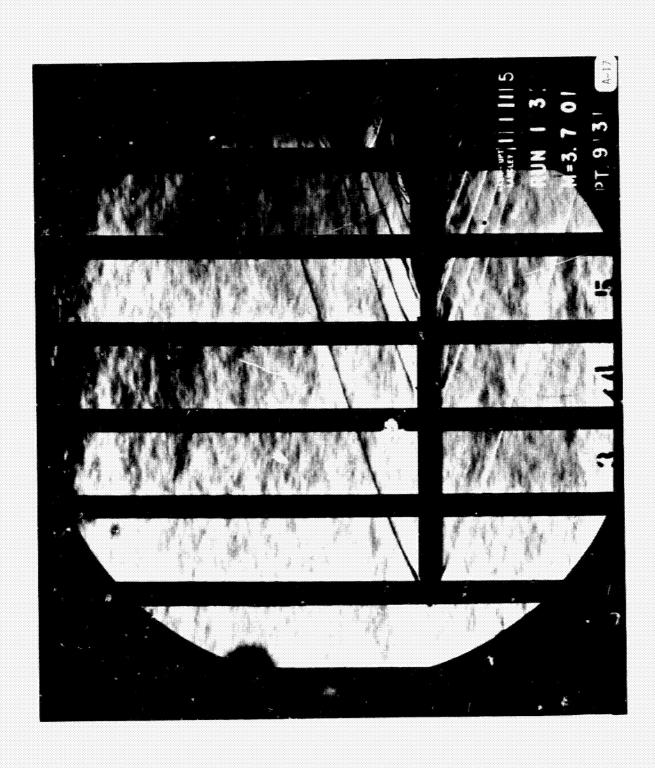


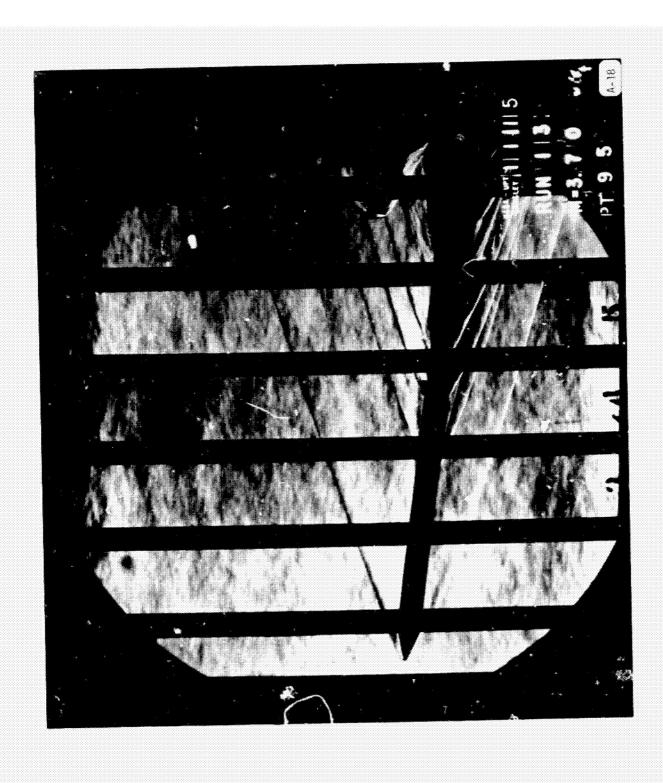


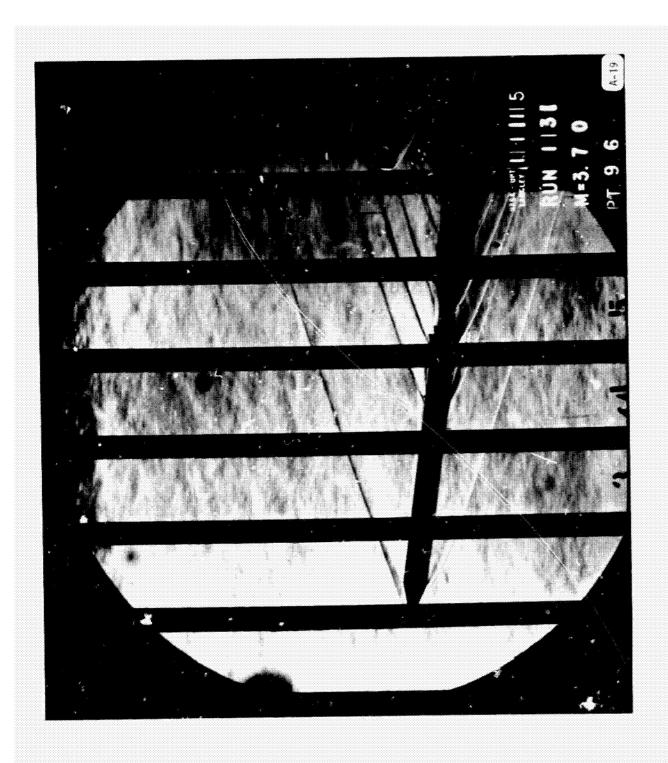


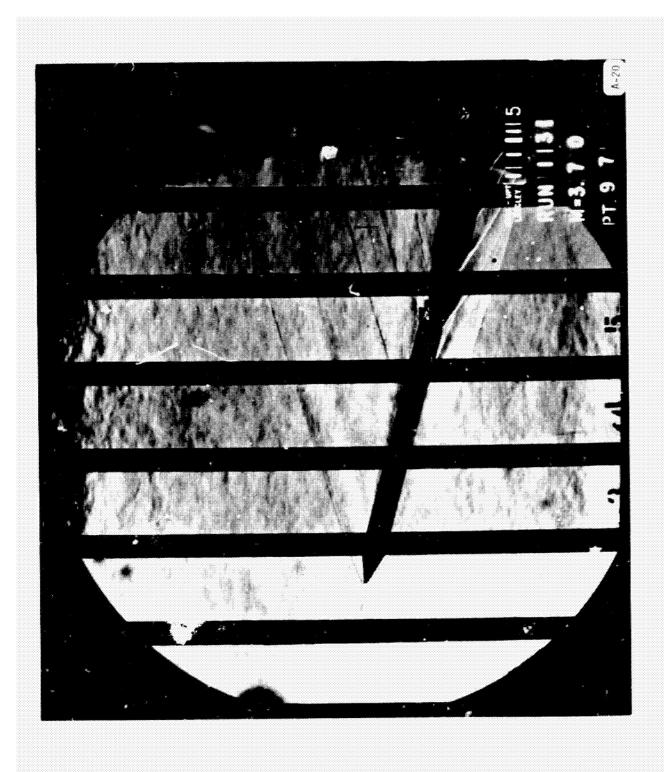


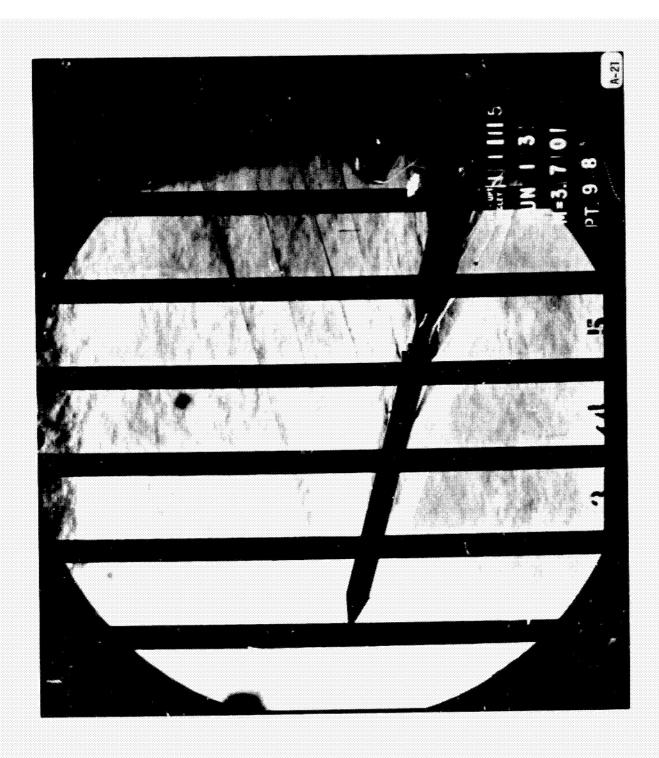




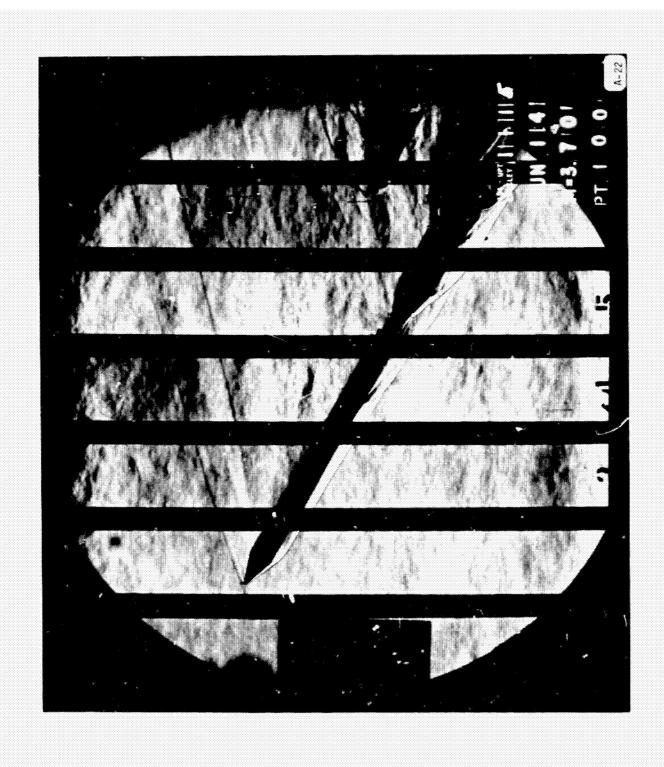


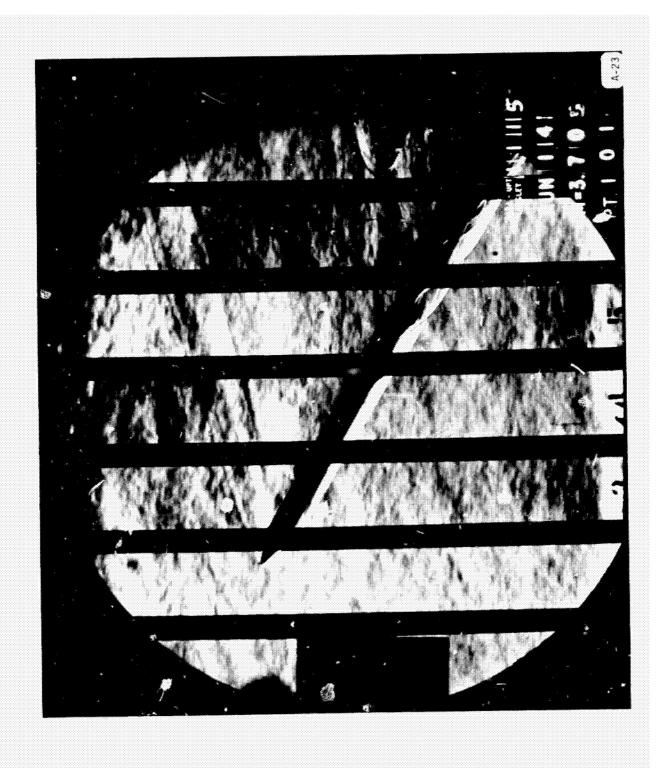


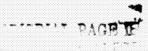


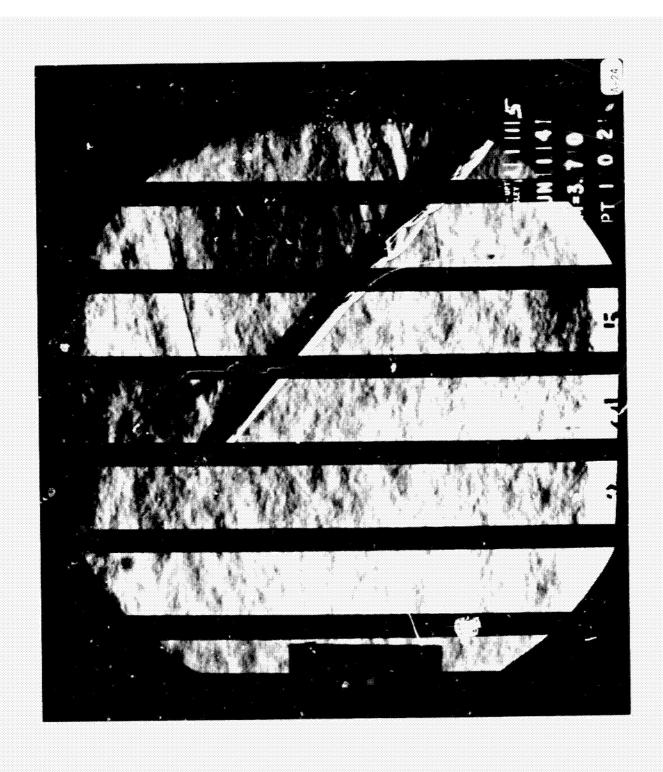


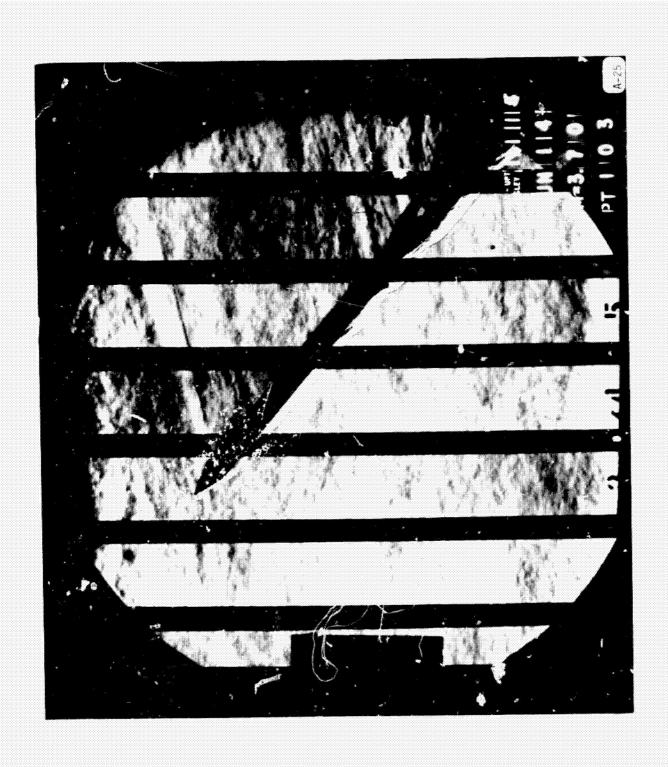
ORIGINAL PAGE I











APPENDIX B
TABULATED DATA

DATE 08 JUN 79 TABULATED DATA - SHIEF PAGE I

				LAR	C UPMT 11	15 (9H-1	ef), sf	<b>18</b> WITH (	B.L. TRIP			(RHAC	1017	( 05 JUN 1	15 1
	REFE	RENCE D	ATA								1	PARAMETR I	C DATA		
SREF - 19	5836.8000	90. IN.	XMRP 4		0000 INC	€S				961	A -	. 000	RN/L	• 2	.500
LREF .	142.0000		YMRP	• .	0000 INC	ÆS				MOO	EL •	1.000			
BREF .	142.0000		2.99		0000 INC	€S									
SCALE -	.0130		-												
ALPHA ( 1)	)	000 1	HACH ( 1	- 3	.700	RN/L	•	3.477	HREF .	. 057	PO	- 7029	900	то -	713.000
SECTION (	1)SR8 (/	AFT STII	NG MT)		NEPENOEN	NT VARIA	BLE H/H	REF							
X/L	. 0265	.0495	. 0972	. 1193	. 1303	. 1789	. 1900	.2010	. 3336	. 3446	. 3557	.4206	.4317	.4427	.5302
THETA															
.000		. 1782	.2551	.0935	.0343	.0356	.0377	.0373	.0746	.0745	.0729		.0763	. 0784	. 0733
22.500			.2119				.0381						. 0787		
45.000		. 1644	.2537	.0981			.0384			.0495			.0762		
67.500		••••	.2601				.0391						. 0755		
90.000	. 1579	. 1689	.2589	.0925			9000			.0735			.0772		
112.500			.2630				.0394						.0772		
135.000		. 1787	.2184	. 1039			.0399			.0729			.0780		
157.590		••••	.2540				.0382						. 0671		
180.000		. 1742		. 1009	.0338	.0355	.0354	.0359	.0731	.0758	.0708	.0707	. 0736	.0761	.0703
X/L	.5412	.5523	.7246	.7357	.7467	.7665	.7776	. 8505	.9616	.8786	. 8837	.8947	. 9058	.9278	.9499
THETA															
.000	. 1778	.0793	.0951	. 1370	. 1318	.0651	. 1006	.0729	.0698	.0729	.0704	. 0546	.0806	. 1683	. 1844
22.500	.0798			*****		,,,,,,									. 1753
45.000	.0779				.1164	.0556						.0748		. 1740	. 1795
67.500	.0779														. 1773
90.000	.0761					.0637						.0703		. 1662	. 1771
112.500	.0754														. 163 <del>9</del>
135.000	.0759				. 1297	.0631						. 0691		. 1631	. 1571
157.500	.0749														. 1602
180.000	.0739	. 3752	.0900	. 1200	. 1264	.0601	.0922	.0658	.0688	.0613	. 0654	. 0579	.0724	. 1573	. 1629
ALPHA ( 21	9.0	000 1	MACH ( 1)	. 3	.700	RN/L	•	3.386	HREF .	.057	PO	- 7010	900	<b>70</b> •	724.000
SECTION (	( 1)5 <b>88</b> (	AFT STI	NS MT)		DEPENDE	T VARIA	RE H/H	REF							
X.*L	. 0265	.0495	.0972	. 1193	. 1303	. 1788	. 1900	.2010	. 3338	.3446	. 3557	.4206	.4317	.4427	.5302
•		- 3 - 5 - 5													
THETA									-		.0465		. 0505	.0617	.0600
.000		.0790	.1177	.0587	.0207	.0219	.0202	.0215	.0442	.0501	. <del></del>		. 0499		
22.500			.1135				.0177			000.			.0420		
45.000		.1110	. 1555	.0699		•	.0178			.026+			.0377		
67.500			. 1943				.0271								
98.000	. 1621	. 1608	<b>.8266</b>	.0921			9000			.0570			.0541		
112.500			1989.				.0565						.0762		
135.000		.2547	.20+9	. 1332			.0813			.0922			. 0953		
157.500			.3452				.0978						. 9986	l	

PAGE 2 TABULATED DATA - SHIEF DATE 08 JUN 75

(RHA001) LARC UPHT 1115 (SH-12F), SRB WITH B.L. TRIP

ALPHA ( 2)	• 9.0	000 M	NCH ( 1	- 3	.700										
SECTION (	1) SRB (/	LFT STING	3 MT)		DEPENDE	NT VARIA	BLE H/HF	₹F							
X/L	. 0265	.0495	.0972	. 1 193	. 1 303	. 1789	. 1900	.2010	. 3336	. 3446	. 3557	.4206	.4317	.4427	.5302
THETA 180.000		.2737		. 1476	. 0799	. 0854	. 1008	.1116	.1053	.1124	.1045	. 1051	. 1 128	.1159	. 1054
X/L	.5412	.5523	.7246	.7357	.7467	.7666	.7776	. 8505	.6616	.6726	0837	.8947	. 9058	.927P	.9499
THETA															
.000	.0653	. 6658	.0997	. 1483	. 1740	.0597	0725	.0910	. 0787	. 0804	. 0787	.0652	.0979	.2198	.2 <del>150</del> .1467
22.500	. 0524				.0751	.0494						. 0598		.1177	.0969
45.000	.0403 .0389				.0751	. 6464						,,,,,,			. 1223
67.500 90.000	.0487					.0397						. 0554		. 1497	,1713
112.500	.0724					1000									. 1942
135.000	.0943				.1767	.0753						.0949		.2414	.2368
157.500	.1095														.2791
180.000	. 1120	. 1155	. 1205	. 1938	.2187	.0972	. 1097	. 1097	. 1159	. 1060	.1142	. 1008	. 1316	. <del>29</del> 00	.2940
ALPHA ( 3)			NCH ( 1) 3 MT)	• 3	.700 DEPENDEI	RN/L NT VARIA	BLE H/H	3.472 REF	HREF .	. 057	PO	- 7029	9.900	10 •	715.000
X/L	.0265	.0495	.0972	. 1 193	. 1303	. 1789	. 1900	.2010	. 3336	. 3446	. 3557	.4206	.4317	.4427	.5302
THETA													_		
.000		. 0535	.0659	.0397	. 0321	. 0344	. 0399	.0426	.0467	.0582	.0547		.0813	.0630	. 0542
22.500			.0762				.0225						.0431		
45.000		. 0977	. 1202	.0519			.0138			.0172			.0329 <b>36</b> 30.		
67.500			. 1802	40.55			.0275			.0455			.0441		
90.000	. 1 <del>059</del>	.2119	.2458	. 0935			9000 .0875			.0455			.0838		
112.500			. 3381	1000			. 1359			. 1 159			. 1237		
135.000 157.500		. 3475	. 3393 . 4706	. 1686			. 1770						.1374		
180.000		. 3903	.4700	. 1986	. 1490	. 1562	.1771	. 1813	. 1492	. 1596	. 1494	. 1532	. 1635		. 1573
X/L	.5412	.5523	. 7246	.7357	.7467	. 7866	. 7776	. 6505	.8616	.8728	.8937	.8947	. 9058	.9878	,9499
THETA .000	.0588	.0605	.0998	. 1376	. 1528	.0528	.0478	.0763	.0654	. 0620	. 0545	.0412	. 0.59:	. 1587	. 1804
. 000 22 . 500	.0930	.0005	. 0000	. 13/0	. 1960										. 1459
45.000	.0346				. 0955	.0421						.0465		. 1944	.0927
67.500	.0265														. 0929
90.000	.0430					. 0368						.0457		. 1305	. 1582
112.500	.0926													_	.2303
135.000	. 1265				.2358	.1107						. 1 354		. 3499	. 3312
157.500	. 1507														,4169

.1699 .1745 .1912 .2960 .3299 .1505 .1870 .1714 .1826 .1648 .1769 .1576 .2049 ,4498 ,4452

180.000

DATE DS JUN 75 TABULATED DATA - SMIRT PAGE 3

LARC UPHT 1115 (SM-12F), SRB MO/BL TRIP AND RING (RMADDE) ( 06 JUN 75 )

				Cm.	C W W. 11										
	REFE	RENCE DA	TA									PARAMETRI	C DATA		
SREF .	5836.8000	50. IN.	XHRP	• .	0000 INCH	ES				861		.000	RN/L	•	3.500
REF .	142.0000	INCHES	YMRP	-	0000 INCH					MOD	EL -	1.000			
REF .	142.0000	INCHES	ZMRP	• .	0000 INCH	ES									
CALE -	. 0130														
LPHA ( )	1) - 30.	D00 M	ACH ( 1	• 3	. 700	RN/L	•	3.416	HREF .	. 057	PO	- 6983	.200	10	- 719.000
SECTION	( 1)5R8 (	AFT STIN	S MT)		DEPENDEN	T VARIA	SLE H/H	REF							
//L	.0265	. 0495	.0972	.1193	. 1303	. 1789	. 1900	.2010	. 3336	. 3446	. 3557	.4206	.4317	.4427	.5302
THETA															
.000		.0703	.0642	. 0322	.0177	.0186	.0195	. 0204	. 0298	.0295	. 0245		.0323		.0263
22.500			.0424				.0246						. 0259		
45.000		. 0750	.0450	.0219			.0164			.0134			.0195		
67.500			.0778				.0237						.0183		
90.000	.2249	. 1703	. 1230	. 0659			9000			.0353			. 0377		
112.500			. 1846				.0800						.0744		
135.000		.3117	. 2053	. ( <b>599</b>			. 1143			. 1021			.1105		
157.500			.2971				. 1 388						. 1250		
180.000		.3742		8405.	. 1248	. 1029	. 1392	. 1414	. 1298	. 1448	. 1356	. 1328	. 1460	. 1527	.1313
/L	.5412	.5523	.7246	.7357	.7467	.7666	.7776	. 8505	.0516	.8726	.6837	.6947	. 9058	.9276	.9489
THETA												A.v.a		.0414	.0467
.000	.0204	. 0276	.0236	.0234	. 0220	. 0226	. 0224	.0213	.0201	.0203	.0191	.0149	.0192	.0414	.0408
22.500	.0233											.0:52		.0339	.0378
45.000	.0179				.0134	.0127						.0106		. 4334	.0829
67.500	.0196											.0477		. 1711	. 1935
90.000	.0404					.0357									. 3362
112.500	.0746					0053						.2030		. 5025	.5079
135.000	.1111				.0905	. 0957									.6950
157.500 160.000	. 1407 . 14 <del>8</del> 4	. 1529	. 1265	. 1358	. 1424	. 1572	. 1551	.2979	.3379	. 3088	. 3432	.2980	.4007	.7812	.7571
LPHA 1 2	e) • 35.	000 M	ACH ( 1:	) - 3	3.700	RN/L	•	3.469	HREF .	.057	PO	- 7011	.700	10	- 714.000
SECTION	(1)589 (	AFT STIN	G MT)		DEPENDEN	T VARIA	BLE H/H	rep							
1/L	. 0265	.0495	.0972	. 1193	, 1303	. 1789	. 1900	.2010	. 3336	. 3446	. 3567	.4806	.4317	.4427	.5392
THETA								<b></b>	-	.0266	.0231		. 0229	.0231	.0206
.003		. 0636	.0507	.0290	.0199	.0209	.0235	.0226	. 0244	. 0200	.0831		.0208	.0231	.0800
22.500			.0390				.0240			.0136			.0168		
45.000		.0796	.0436	.0206						.0136			.0199		
67.500			.0777				.0265			.0423			.0451		
90.000	.2389	. 1750	. 1297	.0744			9000			. UTEJ			.0867		
112.500			.2020				.0918			. 1212			.1268		
135.000		. 3297	. 2262	. 1986			. 1347			. 1616			. 1437		
157.500			. 3205				. 1636						.173/		

LARC UPHT 1115 (SM-18F), SRB MO/SL TRIP AND RING (RHADDE)

ALPHA (2) -	35.000	MACH ( 1) =	3.700
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SECTION (	1)\$80 (4	FT STIN	3 MT)		DEPENDEN	11 4/47/2		•							
!/L	.0265	.0495	.0972	.1193	. 1303	. 1789	. 1900	.2010	, 3336	.3446	. 3557	.4206	.4317	.4427	.5302
THETA				<b>6.</b> 56	44.61		. 1662	. 1687	. 1445	. 1694	. 1546	. 1496	. 1660	. 1742	. 1472
180.000		. 3999		. 2422	. 1451	. 1 191	, 1002	. 1987	. 1449	. 1084	.1340	.1450	. 1000		
//L	.5412	.5523	.7246	.7357	.7467	.7666	.7778	. 8505	.8616	.9726	. 8937	.8947	. 9050	. 9278	.9499
THETA												****		0053	. 0298
. 000	.0214	.0210	.0158	.0154	.0147	.0158	.0148	.0132	.0134	.0119	.0109	.0082	.0115	. 0253	.0267
22.500	.0185											.0111		.0322	.0324
45.003	.0148				.0125	.0117						.0111		. 4366	.0875
67.500	.0220					.0396						.0630		.2163	. 1960
90.000	.0475					.0380						.0000			3528
112.500	. 0891 . 1257				.1124	.1104						.2788		.6419	.5526
135.000 157.500	.1568														.7664
180.000	. 1649	. 1737	.1410	. 1531	.1613	. 1832	. 1741	. 3501	. 3933	.3616	.4017	.3491	.4717	.8896	.8571
LPHA ( 3)	- 40.6	100 M	NCH ( 1:	. 3	.700	RN/L	•	3.545	HREF .	. 051	PO	- 701	1.700	TO -	704.00
ETPTION (	11666 //	ALL STIME	3 MT)		DEPENDEN	IT VARIA	BLE H/HR	EF							
SECTION (	119R9 (/	FT STIN					BLE H/HR								
	.0265	.04 <b>9</b> 5	.0972	.1193	. 1303	IT VAREA . 1789	.1900	.2010	. 3336	. 3446	. 3557	.4206	.4317	.4427	.5302
/L THETA		. 0 <b>49</b> 5	.0972		.1303	. 1789	. 1900	.2010				.4205			
/L THETA .000			.0972	.1193			.1900		.0202	.0219	.3557	.4206	.0210	. 4427	
/L THETA .000 22.500		.0495	.0972 .0803 .0365	.0279	.1303	. 1789	.1900	.2010		.0219		.4205	.0210		
THETA .00C .25.500		. 0 <b>49</b> 5	.0972 .0803 .0365 .0392		.1303	. 1789	.0837 .0833 .0161	.2010				. 4205	.0210 .0164		
THETA .00C 22.500 45.000 67.500	.0265	.0495	.0972 .0603 .0365 .0392 .0756	.0279	.1303	. 1789	.1900 .0837 .0223 .0161 .0277	.2010		.0219		.4205	.0210 .0184 .0154		
/L THETA .00C 22.500 45.000 67.500 90.000		.0495	.0972 .0503 .0365 .0392 .0756	.0279	.1303	. 1789	.0837 .0833 .0161 .0277	.2010		.0219		.4205	.0210 .0164 .0154 .0223		
/L THETA .000 22.500 45.000 67.500 90.000 112.500	.0265	.0495 .0605 .0714 .1839	.0972 .0803 .0366 .0392 .0756 .1343	.0279 .0192 .0755	.1303	. 1789	.0837 .0223 .0161 .0277 9000	.2010		.0219 .0123 .0299		.4205	.0210 .0184 .0154 .0223 .0537		.5302 .0190
/L THETA .000 22.500 45.000 67.500 90.000 112.500 135.000	.0265	.0495	.0972 .0803 .0365 .0392 .0756 .1343 .2158	.0279	.1303	. 1789	.1900 .0837 .023 .0161 .0277 9000 .1092	.2010		.0219		.4205	.0210 .0184 .0154 .0223 .0537 .1036		
7L THETA .00C .22.500 45.000 67.500 90.000 112.500 135.000 157.500	.0265	.0495 .0605 .0714 .1839	.0972 .0803 .0366 .0392 .0756 .1343	.0279 .0192 .0755	.1303	. 1789	.0837 .0223 .0161 .0277 9000	.2010		.0219 .0123 .0299		.4206	.0210 .0184 .0154 .0223 .0537		
7L THETA .00C 22.500 45.000 67.500 90.000 112.500 135.000 157.500 190.000	.0265	.0995 .0605 .0714 .1839	.0972 .0803 .0365 .0392 .0756 .1343 .2158	.0279 .0192 .0755 .2008	.0105	. 1769	.1900 .0837 .023 .0161 .0277 9000 .1092 .1852	.2010 .0267	.0202	.0219 .0123 .0129 .0499	.0193		.0210 .0184 .0154 .0223 .0537 .1038 .1519	.0203	.0190
THETA	.0265	.0495 .0605 .0714 .1839 .3714	.0972 .0503 .0365 .0392 .0756 .1343 .2158 .2464 .3579	.0279 .0192 .0755 .2008	.1303	.1789	.1900 .0237 .0223 .0161 .0277 9000 .1092 .1862 .2088	.2010	. 1846	.0219 .0123 .0499 .1462	.0193	.1926	.0210 .0184 .0154 .0223 .0537 .1038 .1519 .1710	.0203	.0190
THETA	.2509	.0495 .0605 .0714 .1839 .3714 .4639	.0972 .0803 .0366 .0392 .0756 .1343 .2158 .2464 .3579	.0279 .0192 .0755 .2008 .2853	.1303	.1799	.1900 .0237 .0223 .0161 .0277 9000 .1092 .1862 .2088	.2010	. 1846	.0219 .0123 .0499 .1462	.0193	.1926	.0210 .0184 .0154 .0223 .0537 .1038 .1519 .1710	.0203	.0190
/L THETA .00C 22.500 45.000 67.500 90.000 112.500 135.000 157.500 160.000 /L THETA .000	.2509	.0495 .0605 .0714 .1839 .3714	.0972 .0503 .0365 .0392 .0756 .1343 .2158 .2464 .3579	.0279 .0192 .0755 .2008	.1303	.1789	.1900 .0237 .0223 .0161 .0277 9000 .1092 .1662 .2088 .2101	.2010 .0267 .2163	.1846	.0219 .0123 .0499 .1462 .2087	.0193 .1965 .9937	.1826	.0210 .0184 .0154 .0223 .0537 .1038 .1519 .1710 .2019	.0203	.0190
/L THETA .00C 22.500 45.000 67.500 90.000 112.500 135.000 157.500 190.000 /L THETA .000 22.500	.2509 .5412 .0198 .0178	.0495 .0605 .0714 .1839 .3714 .4639	.0972 .0803 .0366 .0392 .0756 .1343 .2158 .2464 .3579	.0279 .0192 .0755 .2008 .2853	.1303	.1799	.1900 .0237 .0223 .0161 .0277 9000 .1092 .1662 .2088 .2101	.2010 .0267 .2163	.1846	.0219 .0123 .0499 .1462 .2087	.0193 .1965 .9937	.1826	.0210 .0184 .0154 .0223 .0537 .1038 .1519 .1710 .2019	.0203	.0190
/L THETA .000 22.500 45.000 67.500 90.000 112.500 135.000 157.500 190.000 /L THETA .000 22.500 45.000	.0265 .2509 .5412 .0198 .0178 .0164	.0495 .0605 .0714 .1839 .3714 .4639	.0972 .0803 .0366 .0392 .0756 .1343 .2158 .2464 .3579	.0279 .0192 .0755 .2008 .2853	.1802	.1789 .0205 .1515 .7886	.1900 .0237 .0223 .0161 .0277 9000 .1092 .1662 .2088 .2101	.2010 .0267 .2163	.1846	.0219 .0123 .0499 .1462 .2087	.0193 .1965 .9937	.1926	.0210 .0184 .0154 .0223 .0537 .1038 .1519 .1710 .2019	.0203	.0190 .1752 .9499 .0248 .0221
/L THETA .00C 22.500 45.000 67.500 90.000 112.500 135.000 157.500 190.000 /L THETA .000 22.500 45.000 67.500	.0265 .2509 .5412 .0196 .0178 .0164	.0495 .0605 .0714 .1839 .3714 .4639	.0972 .0803 .0366 .0392 .0756 .1343 .2158 .2464 .3579	.0279 .0192 .0755 .2008 .2853	.1802	.1789 .0205 .1515 .7886	.1900 .0237 .0223 .0161 .0277 9000 .1092 .1662 .2088 .2101	.2010 .0267 .2163	.1846	.0219 .0123 .0499 .1462 .2087	.0193 .1965 .9937	.1926	.0210 .0184 .0154 .0223 .0537 .1038 .1519 .1710 .2019	.0203	.0190 .1752 .9%96 .0248 .0221 .0256
/L THETA .000 22.500 45.000 67.500 90.000 112.500 135.000 157.500 190.000 /L THETA .000 22.500 45.000 67.500 90.000	.0265 .2509 .5412 .0198 .0178 .0164	.0495 .0605 .0714 .1839 .3714 .4639	.0972 .0803 .0366 .0392 .0756 .1343 .2158 .2464 .3579	.0279 .0192 .0755 .2008 .2853	.1802	.1789 .0205 .1515 .7666 .0117	.1900 .0237 .0223 .0161 .0277 9000 .1092 .1662 .2088 .2101	.2010 .0267 .2163	.1846	.0219 .0123 .0499 .1462 .2087	.0193 .1965 .9937	.1926 .8947 .0104	.0210 .0184 .0154 .0223 .0537 .1038 .1519 .1710 .2019	.0203 .2112 .9278 .0275	.0190 .1752 .9+98 .0248 .0221 .0263 .2023
/L THETA .000 22.500 45.000 67.500 90.000 112.500 135.000 157.500 190.000 /L THETA .000 22.500 45.000 67.500 90.000 112.500	.0265 .2509 .5412 .0198 .0179 .0164 .0249 .0523	.0495 .0605 .0714 .1839 .3714 .4639	.0972 .0803 .0366 .0392 .0756 .1343 .2158 .2464 .3579	.0279 .0192 .0755 .2008 .2853	.1802	.1789 .0205 .1515 .7666 .0117	.1900 .0237 .0223 .0161 .0277 9000 .1092 .1662 .2088 .2101	.2010 .0267 .2163	.1846	.0219 .0123 .0499 .1462 .2087	.0193 .1965 .9937	.1926 .8947 .0104	.0210 .0184 .0154 .0223 .0537 .1038 .1519 .1710 .2019	.0203 .2112 .9278 .0275	.0190 .1752 .9499 .0241 .0256 .0903 .2023 .3816 .6174
/L THETA .000 22.500 45.000 67.500 90.000 112.500 135.000 157.500 180.000 /L THETA .000 22.500 45.000 67.500	.0265 .2509 .5412 .0198 .0178 .0164 .0249 .0523	.0495 .0605 .0714 .1839 .3714 .4639	.0972 .0803 .0366 .0392 .0756 .1343 .2158 .2464 .3579	.0279 .0192 .0755 .2008 .2853	.1303 .0195 .1802 .7467 .0109	.1799 .0205 .1515 .7666 .0117 .0102	.1900 .0237 .0223 .0161 .0277 9000 .1092 .1662 .2088 .2101	.2010 .0267 .2163	.1846	.0219 .0123 .0499 .1462 .2087	.0193 .1965 .9937	.1925 .8947 .0104 .0146	.0210 .0184 .0154 .0223 .0537 .1038 .1519 .1710 .2019	.0203 .2112 .9278 .0275 .0327	.0190 .1752 .9999 .0291 .0256 .0803 .2023



DATE OF JAN 75 TABLEATED DATA - SHIZF PAGE

LARC UPHT 1115 (SH-12F), SRB HO/BL TRIP AND RING (RHA003) ( 08 JUN 75 )

.2070

. 3078

.4143

.3487

.6132

.8212

.5284

. 72<del>20</del>

.8037

REFERENCE DATA PARAMETRIC DATA

 SREF = 19836.8000 SQ.IN.
 XMRP = .0000 INCHES
 .0000 INCHES
 BETA = .0000 RN/L = 3.900

 LREF = 148.0000 INCHES
 YMRP = .0000 INCHES
 MODEL = 1.000

BREF - 142.0000 INCHES ZHEP - .0000 INCHES

SCALE . .0130

135.000

157.500

190.000

. 1122

. 1402

. 1478

. 1535

. 1261

. 1362

ALPHA ( 1) = 30.000 MACH ( 1) = 3.700 RN/L = 3.490 MREF = .057 PO = 7021,200 TO = 708,000

SECTION ( 1)SRB (AFT STING HT) DEPENDENT VARIABLE H/HREF X/L .0495 . 0972 .1193 . 1303 . 1789 . 1900 .2010 . 3336 .3446 . 3957 .4206 .4317 .4427 .5302 THETA .000 .0716 .0622 . 0330 .0176 .0196 .0209 .0212 .0279 .0294 .0348 .0343 .0283 22.500 . 2436 .0244 .0286 45.000 .0783 . 3463 . 0232 .0169 .0139 .0208 67.500 .0791 .0240 .0199 90.000 .1708 . 1237 .0684 -.9000 .0360 .0394 112.500 . 1840 .0797 .0759 135.000 . 3098 .2032 . 1612 .1136 .1016 .1105 157.500 .2031 .1362 . 1260 180.000 .3700 .2067 .1198 .1006 .1370 . 1377 .1244 .1420 . 1334 .1316 . 1459 . 1521 . 1309 X/L .5412 .5523 .7246 .7357 .7467 .7666 .7776 .8505 .8616 .8726 .8837 .8947 .9058 .9278 .9499 THETA .000 .0309 . 6301 .0249 .0235 .0254 .0239 .0230 .0224 .0216 . 0222 .0210 .0171 1150. .0425 .0500 22.500 .0250 .0420 45.000 .0190 .0141 .0135 .0139 .0375 .0407 67.500 .0208 .0909 90.000 .0412 .0365 .0491 . 1804 .2000 112.500 .0747 . 3483

. 1005

. 1428

.0974

. 1559

. 1516

.3002

.3415 .3148



LARC UPNT 1115 (SM-12F), SRB HITHOUT B. L. TRIP (RHADON) ( 06 JUN 75 )

	REFE	RENCE DAT	ra .								4	PARAMETRIC	DATA		
	6 <b>36.8000</b> 142.0000		XPERP (		0000 INCHE	_				8E TA		.000 1.000	RN/L	• 1	. 500
•	142.0000		ZHRP		0000 INCHE	:\$									
SCALE -	.0130	,													
														TO -	704.000
ALPHA ( 1)	• .	0 <b>0</b> 0 M	NCH ( 1:	• 3	. 700	RN/L	•	1.527	HREF •	.037	PO	- 3022	. 100	,0	,04.900
SECTION (	11588 (	AFT STIN	3 MTI		DEPENDENT	VARIA	SLE H/HF	ÆF							
X/L	.0265	.0495	. 0972	.1193	. 1303	. 1789	. 1900	.2010	. 3336	. 3446	. <b>35</b> 57	.4205	.4317	.4427	.5302
THETA														.0155	.0137
.000		.1144	. 0986	. 0529	. 1)222	. 0220	.0233	.0208	.0142	.0137	.0:39		.0149		.0137
22.500			. 0978				.0240						.0149		
45.000		. 1202	. 1059	.0543			.0258			.0091			.0155		
67.500			. 1074				. 0254						.0143		
90.000	. 1957	.1187	. 1023	.0510			.0155			.0149			.0148		
112.500			. 1054				. 0242						.0147		
135.000		. 1212	1.0918	.0577			.0247			.0141			.0136		
157.500			.1025				.0236					0.07	.0125		.0122
180.000		.1164		. 0569	.0229	.0221	.0215	.0207	.0129	.0148	.0126	.0123	.0130	.0130	.0166
X/L	.5412	.5523	.7246	.7357	.7467	. 7666	.7776	. 8505	.9616	.9726	.6837	.8947	. 9058	. 9278	. 9 <b>499</b>
THETA												4200	0500	.1473	. 2893
.000	.0133	.0134	.0152	.0183	.0162	.0150	.0109	.0358	.0379	.0392	.0408	.0320	. 0562	.1473	.2075
22.500	.0138											.0391		. 1397	.2148
45.000	.0138				.0195	.0140						.0391		. 1397	.2067
67.500	.0138											.0373		. 1391	.2154
90.000	.0130					.0152						.03/3		. 1351	.1996
112.500	.0128											.0436		. 1438	. 1930
135.000	.0116				.0155	9156						.0436		. 1 430	.1972
157.500 190.000	.012 <b>5</b> .0121	.0125	.0147	.0184	.0144	.0169	.0135	.0326	.0357	.0360	.0400	. 0395	.0516	. 1414	, 1965
				_			_		HREF •	.037	PO	- 3025	000	TO •	704.000
ALPHA ( 2)	• B.	000 H	ACH ( 1	) - 3	.790	RN/L	•	1.529	Her.	.037		- 2023			70
SECTION (	135RB (	AFT STIN	G MT)		DEPENDEN	T VARIA	BLE HM	REF							
X/L	.0265	.0495	.0972	.1193	. 1303	. 1799	. 1900	.2010	. 3336	. 3446	. 3557	-4206	.4317	.4427	.5302
THETA															0810
.000		. 0055	.0418	. PP44	.0088	.0083	.0082		1950.	.0315	.0303		.0438		.0519
22.500			.0476				.0088						.0268		
45.000		.0882	.0720	.0407			.0123			. 0058			.0120		
67.500			. 0921				. 0208						.0116		
90.000	. 1616	. 1270	. 1091	. 0549			.0191			. 0242			1990.		
112.500			. 1265				.0377						.0343		
135.000		. 1875	. 1237	, 0798			.0452			. 0389			.0422		
157.500		_	. 1441				. 0500						. 0440	t	

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PAGE 7 DATE 06 JUN 75 TABULATED DATA - SHIEF

				LAR											
LPHA ( 2)	- 8.0	700 M	NCH ( 1)	) - 3	.700										
SECTION (	1)588 (/	FT STIN	MT)		DEPENDEN	NT VARIA	BLE H/HRE	EF							
/L	. 0265	.0495	.0972	.1193	. 1 303	. 1789	. 1900	.2010	. 3336	. 3446	. 3557	.4206	.4317	.4427	. 5302
THETA															
180.000		. 1769		. 0964	.0432	. 0441	.0479	. 0479	.0420	.0475	.0408	.0428	. 0475	.0492	.0443
n.	.5412	. 5523	.7246	.7357	.7487	.7666	.7776	.8505	.8616	. 9726	. 8037	.8947	. 9058	. 9278	. 9499
THETA															
.000	.0571	.0581	.0992	. 1291	. 1423	.0748	.0614	.0472	. 0497	. 0506	. 0536	.0488	.0775	. 1612	. 1778
22.500	.0366														. 1351
45.000	.0192				.0463	.0312						. 06 <del>59</del>		. 1160	. 1050
67.500	.0125														.1173
90.000	.0189					.0164						.0513		. 1289	. 1568
112.500	.0329														. 1773
135.060	.0424				. 0979	.0419						.0761		.2061	.2082
157.5	.0476														.2381
18~ 000	. 0494	.0489	. 0958	. 1209	. 1 350	. 0 <del>65</del> 4	.0572	.0951	. 0990	.0819	.0861	.0812	. 1056	.2424	.246
			NCH ( 1)	1 • 3	. 700 DEPENDEI	RN/L NT VARIA	BLE H/HR		HREF •	.037	PO	- 2996	3. <b>50</b> 0	TO •	<del>593</del> .
SECTION (				.1193					.3338	. 037	P0 . 3557	- 2996 .4206	.4317	.4427	
SECTION (	1)588 (/	.0495	.0972	.1193	DEPENDER	NT VARIA	BLE H/HR	.2010	.3336	. 3446	. 3557		.4317	.4427	. 530
SECTION ( /L THETA .000	1)588 (/	AFT STING	.0972 .0397	-	DEPENDE	NT VARIA	. 1900 . 0346	EF			·		.4317		. 530
SECTION ( /L THETA .000 22.500	1)588 (/	.0495 .0590	.0972 .0972 .0397	.1193	DEPENDER	NT VARIA	.0346 .0195	.2010	.3336	. 3446	. 3557		.4317 .0516 .0358	.4427	. 530
SECTION ( /L THETA .000 22.500 45.000	1)588 (/	.0495	.0972 .0972 .0397 .0446	.1193	DEPENDER	NT VARIA	.1900 .0346 .0195	.2010	.3336	. 3446	. 3557		.4317 .0516 .0359 .0218	.4427	. 530
SECTION ( /L THETA .000 82.500 45.000 67.500	.0205	.0495 .0495 .0598	.0972 .0972 .0397 .0446 .0890	.0260	DEPENDER	NT VARIA	. 1900 . 0346 . 0195 . 0133 . 0247	.2010	.3336	.0463	. 3557		.9317 .0516 .0359 .0218	.4427	. 530
SECTION ( /L THETA	1)588 (/	.0495 .0590	.0972 .0972 .0397 .0446 .0990 .0977	.1193	DEPENDER	NT VARIA	. 1900 . 0346 . 0195 . 0133 . 0247 . 0293	.2010	.3336	. 3446	. 3557		.9317 .0516 .0359 .0218 .0185	.4427	. 530
SECTION ( /L THETA .000 22.500 45.000 67.500 90.000 112.500	.0205	.0495 .0495 .0598 .0995	.0972 .0972 .0397 .0446 .0990 .0977 .1238	.0260 .0395	DEPENDER	NT VARIA	. 1900 . 03%6 . 0195 . 0133 . 0247 . 0293 . 0554	.2010	.3336	.3446 .0463 .0158	. 3557		.9516 .0359 .0218 .0195 .0305	.4427	. 530
SECTION ( /L THETA	.0205	.0495 .0495 .0598	.0972 .0972 .0397 .0446 .0490 .0977 .1238 .1576	.0260	DEPENDER	NT VARIA	. 1900 . 0346 . 0195 . 0133 . 0247 . 0293 . 0554 . 0705	.2010	.3336	.0463	. 3557		.9317 .0516 .0359 .0218 .0185 .0305 .0480	.4427	. 530
SECTION ( /L  THETA	.0205	.0495 .0598 .0598 .0595 .1599	.0972 .0972 .0397 .0446 .0990 .0977 .1238	.1193 .0260 .0395 .0669	. 1303 . 0259	NT VARIA	. 1900 . 0346 . 0195 . 0193 . 0247 . 0203 . 0554 . 0705 . 0903	.2010 .0380	.3336	.3446 .0463 .0158 .0296	.3557 .0424	.4206	.9317 .0516 .0359 .0185 .0185 .0305 .0480	.4427 .6492	. 530
SECTION ( /L THETA	.0205	.0495 .0495 .0598 .0995	.0972 .0972 .0397 .0446 .0490 .0977 .1238 .1576	.0260 .0395	DEPENDER	NT VARIA	. 1900 . 0346 . 0195 . 0133 . 0247 . 0293 . 0554 . 0705	.2010	.3336	.3446 .0463 .0158	. 3557		.9317 .0516 .0359 .0218 .0185 .0305 .0480	.4427	. 530
SECTION ( /L THETA	.0205	.0495 .0598 .0598 .0595 .1599	.0972 .0972 .0397 .0446 .0490 .0977 .1238 .1576	.1193 .0260 .0395 .0669	. 1303 . 0259	NT VARIA	. 1900 . 0346 . 0195 . 0193 . 0247 . 0203 . 0554 . 0705 . 0903	.2010 .0380	.3336	.3446 .0463 .0158 .0296	.3557 .0424	.4206	.9317 .0516 .0359 .0185 .0185 .0305 .0480	.4427 .6492	.530/
SECTION ( /L THETA	11588 (7	.0495 .0590 .0590 .0995 .1599 .2345	.0972 .0972 .0397 .0446 .0500 .0977 .1238 .1576 .1619 .1900	.1193 .0260 .0395 .0669 .1119 .1297	.1303 .0259 .0709 .7467	.1789 .0292 .0715	. 1900 . 0346 . 0195 . 0133 . 0247 . 0293 . 0705 . 0705 . 0903 . 0900	.0390 .0390	.3336 .0374 .0651	.3446 .0463 .0159 .0296 .0569 .0724	.0648	. 4206	.4317 .0516 .0358 .0218 .0185 .0305 .0480 .0637 .0760	.0492	.530/
SECTION ( /L  THETA .000 22.900 45.000 67.500 90.000 112.500 1125.000 1180.000 /L	.1988	.0495 .0590 .0590 .0995 .1599 .2345	.0972 .0972 .0397 .0446 .0590 .0977 .1239 .1576 .1619	.1193 .0260 .0395 .0669 .1119	.1303 .0259	.1789 .0292	. 1900 . 0346 . 0195 . 0133 . 0247 . 0203 . 0554 . 0705 . 0803	.2010 .0380	. 3338	.3446 .0463 .0158 .0296 .0569	.0424	. 4206	.9516 .0596 .0298 .0185 .0305 .0480 .0637 .0780	.4427 .6492	.530/
SECTION (  /L  TN€TA000 22.900 45.000 67.500 90.000 112.500 135.000 157.500 180.000 /L	1)588 (/ .0205 .1988 .1988	.0990 .0990 .0990 .0990 .1999 .2945 .2990	.0972 .0972 .0397 .0446 .0500 .0977 .1238 .1576 .1619 .1900	.1193 .0260 .0395 .0669 .1119 .1297	. 1303 . 0259 . 0709 . 7467	.1789 .0292 .0715 .7866	. 1900 . 0346 . 0195 . 0133 . 0247 . 0293 . 0705 . 0705 . 0903 . 0900	.0390 .0390	.3336 .0374 .0651	.3446 .0463 .0159 .0296 .0569 .0724	.0648	. 4206 . 0590 . 6947 . 0246	.4317 .0516 .0358 .0218 .0185 .0305 .0480 .0637 .0760	.0492	.530/ .044* .071( .949)
SECTION ( //L THETA	.1988	.0990 .0990 .0990 .0990 .1999 .2945 .2990	.0972 .0972 .0397 .0446 .0500 .0977 .1238 .1576 .1619 .1900	.1193 .0260 .0395 .0669 .1119 .1297	.1303 .0259 .0709 .7467	.1789 .0292 .0715	. 1900 . 0346 . 0195 . 0133 . 0247 . 0293 . 0705 . 0705 . 0903 . 0900	.0390 .0390	.3336 .0374 .0651	.3446 .0463 .0159 .0296 .0569 .0724	.0648	. 4206	.4317 .0516 .0358 .0218 .0185 .0305 .0480 .0637 .0760	.0492	.530i
THETA .000 22.500 1135.000 1257.500 1257.500 1257.500 1257.500 1257.500 1257.500 1257.500 1257.500 1257.500 1257.500 1257.500 1257.500 1257.500 1257.500 1257.500 1257.500 1257.500 1257.500	. 1988 (7 . 0295 . 1988 . 5412 . 0518 . 0364 . 0191 . 0170	.0990 .0990 .0990 .0990 .1999 .2945 .2990	.0972 .0972 .0397 .0446 .0500 .0977 .1238 .1576 .1619 .1900	.1193 .0260 .0395 .0669 .1119 .1297	. 1303 . 0259 . 0709 . 7467	.0292 .0292 .0715 .7666	. 1900 . 0346 . 0195 . 0133 . 0247 . 0293 . 0705 . 0705 . 0903 . 0900	.0390 .0390	.3336 .0374 .0651	.3446 .0463 .0159 .0296 .0569 .0724	.0648	. 4206 . 0590 . 6947 . 0246 . 0458	.4317 .0516 .0358 .0218 .0185 .0305 .0480 .0637 .0760	.0492 .0492 .0774 .9278 .0884	.530 .044 .071 .949 .171 .142 .094
SECTION ( /L THETA	. 1988 . 1988 . 1988 . 5412 . 0518 . 0384 . 0191 . 0170 . 0289	.0990 .0990 .0990 .0990 .1999 .2945 .2990	.0972 .0972 .0397 .0446 .0500 .0977 .1238 .1576 .1619 .1900	.1193 .0260 .0395 .0669 .1119 .1297	. 1303 . 0259 . 0709 . 7467	.1789 .0292 .0715 .7866	. 1900 . 0346 . 0195 . 0133 . 0247 . 0293 . 0705 . 0705 . 0903 . 0900	.0390 .0390	.3336 .0374 .0651	.3446 .0463 .0159 .0296 .0569 .0724	.0648	. 4206 . 0590 . 6947 . 0246	.4317 .0516 .0358 .0218 .0165 .0305 .0480 .0637 .0760 .0762	.0492	.530/ .094* .071/ .999 .171/ .094 .077
SECTION ( /L THETA	.0205 .0205 .1900 .5%12 .0510 .0304 .0191 .0170 .0209 .0%70	.0990 .0990 .0990 .0990 .1999 .2945 .2990	.0972 .0972 .0397 .0446 .0500 .0977 .1238 .1576 .1619 .1900	.1193 .0260 .0395 .0669 .1119 .1297	.1303 .0259 .0709 .7467 .1043	.0715 .7668 .0290 .0312	. 1900 . 0346 . 0195 . 0133 . 0247 . 0293 . 0705 . 0705 . 0903 . 0900	.0390 .0390	.3336 .0374 .0651	.3446 .0463 .0159 .0296 .0569 .0724	.0648	. 4206 . 0590 . 8947 . 0246 . 0458	.4317 .0516 .0358 .0218 .0165 .0305 .0480 .0637 .0760 .0762	.0492 .0492 .0774 .9278 .0984 .0993	.5306 .0997 .9999 .1716 .1987 .1165
SECTION (  /L  TH€TA .000 82.900 45.000 67.500 90.000 112.500 135.000 157.500 180.000 /L  TH€TA .000 82.900 45.000 67.500 90.000 112.500 112.500 1135.000	. 1988 (7 . 0205 . 1988 . 5912 . 0318 . 0384 . 0178 . 0209 . 0970 . 0896	.0990 .0990 .0990 .0990 .1999 .2945 .2990	.0972 .0972 .0397 .0446 .0500 .0977 .1238 .1576 .1619 .1900	.1193 .0260 .0395 .0669 .1119 .1297	. 1303 . 0259 . 0709 . 7467	.0292 .0292 .0715 .7666	. 1900 . 0346 . 0195 . 0133 . 0247 . 0293 . 0705 . 0705 . 0903 . 0900	.0390 .0390	.3336 .0374 .0651	.3446 .0463 .0159 .0296 .0569 .0724	.0648	. 4206 . 0590 . 6947 . 0246 . 0458	.4317 .0516 .0358 .0218 .0165 .0305 .0480 .0637 .0760 .0762	.0492 .0492 .0774 .9278 .0884	.5308 .0447 .0715 .9495 .1716 .1427 .0945 .1165 .1866 .2638
.000 22.900 45.000 67.500 90.000 112.500 135.000 157.500 180.000 17L THE TA .000 22.500 45.000 67.500	.0205 .0205 .1900 .5%12 .0510 .0304 .0191 .0170 .0209 .0%70	.0990 .0990 .0990 .0990 .1999 .2945 .2990	.0972 .0972 .0397 .0446 .0500 .0977 .1238 .1576 .1619 .1900	.1193 .0260 .0395 .0669 .1119 .1297	.1303 .0259 .0709 .7467 .1043	.0715 .7668 .0290 .0312	. 1900 . 0346 . 0195 . 0133 . 0247 . 0293 . 0705 . 0705 . 0903 . 0900	.0390 .0390	.3336 .0374 .0651	.3446 .0463 .0159 .0296 .0569 .0724	.0648	. 4206 . 0590 . 8947 . 0246 . 0458	.4317 .0516 .0358 .0218 .0165 .0305 .0480 .0637 .0760 .0762	.0492 .0492 .0774 .9278 .0984 .0993	. 5302 . 5302 . 0447 . 0719 . 9499 . 1719 . 1827 . 0949 . 1185 . 1850 . 28321 . 3490

PAGE 8 TABULATED DATA - SHIEF DATE 06 JUN 75

(RHA004) LARC UPHT 1115 (94-12F), SRB HITHOUT B. L. TRIP 709.000

NLPHA ( 4)	- 30.5	on MA	CH ( 1)	- 3.	700	RN/L	- 1	.501	HREF .	.037	PO	• 3011		10		709.00
SECTION (	1)5R9 (A	FT STING	нт		DEPENDENT	T VARIAS	LE H/HRE	F								
K/L	.0205	.0495	.0972	.1193	. 1303	. 1789	. 1900	.2010	. 3336	3446	. 3 <del>55</del> 7	.4206	.4317	.442	,	.5302
THETA									0.2Eu	.0271	.0237		.0240	. 024	3	.0198
.000		.0617	. 0527	. 0262	.0153	.0156	.0171	.0171	.0254	.0671	.005		.0215			
22.500			. 0368				.0153						.0165			
45.000		.0750	.0423	.0210			.0126			.0114			.0178			
67.500			.0734				.0227						.0376			
90.000	.2267	. 1691	. 1200	. 0652			9000			. 0342			.0726			
112.500			. 1811				.0778						. 1090			
		.3020	.2077	. 1589			.1134			.0987			. 1090			
135.000		. 5000	.2826				. 1369							. 151	•	. 1339
157.500		. 3606		. 2032	. 1235	. 1229	. 1383	. 1393	. 1 <i>2</i> 63	. 1437	.1311	. 1332	. 1460	. 191	7	. 133
X/L	.5412	.5523	.7246	.7357	.7467	.7666	.7 <del>7</del> 76	.8505	.9616	.8726	.8837	.8947	.9058	.927	8	.9491
																000
THETA			.0406	.0416	.0360	.0140	.0095	.0294	.0283	.0265	. 0243	.0195	.0216	950.	19	.026
. 000	.0208	.0195	.0400	.0410	.0300		1000-								_	.023
22.509	.0162				.0177	.0155						.0142		.025	.5	. 024
45.000	.0149				.0177	.0193										. 062
67.500	.0191					.0519						. 0595		. 136	<b>;9</b>	. 142
90.000	.0392					. 0318										.292
112.500	.0756											. 1880		.434	18	. 391
135.000	.1114				. 31 35	. 1957						,				.515
157.500	.1911							25.22	. 2693	.2468	.2638	.2404	. 3103	. 596	<del>)</del> 9	.556
160.000	. 1487	. 1533	.2849	.4343	. 4929	. 2852	.3199	. 2529	. 2093							
ALPHA ( B)	• 40.	000 H	ACH ( 1	) - 3	.700	RN/L			HREF -	.037	r PO	- 3016	5.100	10	•	709.
SECTION (	(11589 (	AFT STIN	G HT)		DEPENDEN	AT VARIA	BLE HIHR	EF								
X/L															-	<b>6 W</b>
A/L	. 0265	.0495	.0972	. 1193	. 1303	. 1789	. 1900	.2010	. 3336	. 3446	. 3557	.4205	.4317	7 .44ê	c /	. 55
neta	. 0265	.0495										.4205	.4317			
	. 0 <del>265</del>	.0495	.0972	.1193	.1303	. 1789	.0122	.2010	.3336	. 3446	.3557	.4205	.9146	5 .010		
THETA	. 0265			. 0249			.0122			.0159		.4206	.0196	5 .016 5		
THETA .000	.0265		.0519				.0122 .0125 1010.					.4206	.0146 .0196 3010.	5 .016 5		
AT3HT .000 .000.55 000.54	.0 <del>265</del>	.0529	.0519 .0324	. 0249			.6122 7510. 1010. 0+50.			.0159		. <b>4206</b>	. 9146 9010. 910. 9000.	5 .Q16 5 5		
THETA .000 22.500 45.000 67.900	.2950	.0529	.0519 .0324 .0356	. 0249			.6122 .6210. 1010. 0450.			.0159		.4205	.9146 .0150 .0130 .0201 .0201	5 .016 5 5 9		
THETA .000 22.500 45.000 67.900 90.000		.0529	.0519 .0324 .0356	.0 <b>249</b> .0196			.0122 .0125 .0101 .0240 -,9000			.0159		.4205	.9146 .0196 .0136 .0206 .0475	5 .014 5 5 9		
THETA .000 22.500 45.000 67.900 90.000		.0529	.0519 .0324 .0356 .0711	.0 <b>249</b> .0196			.0122 .0125 .0101 .0240 -,9000 .1017			.0159		.4205	.0196 .0196 .0136 .0206 .0476 .0946	5 .014 5 5 8 9		
THETA .000 22.500 45.000 67.500 90.000 112.500 135.000		.0529 .6709 .1791	.0518 .0324 .0356 .0711 .1274 .2042	.0249 .0196 .0725			.0122 .0125 .0101 .0240 9000 .1017 .1559	.0130	.9162	.0159	.0132		.91%6 .01%6 .01%6 .0206 .0475 .09%6 .1418	5 .016 5 5 9 9 8 8	69	.016
THETA .000 22.500 45.000 67.900 90.000 112.500		.0529 .6709 .1791	.0519 .0324 .0356 .0711 .1274 .2042	.0249 .0196 .0725			.0122 .0125 .0101 .0240 -,9000 .1017			.0159		.4206	.0196 .0196 .0136 .0206 .0476 .0946	5 .016 5 5 9 9 8 8	69	.010
71€7A .000 22.500 45.008 67.500 112.500 135.000 157.500 160.900		.0529 .0709 .1791 .3486	.0519 .0324 .0356 .0711 .1274 .2042	.0249 .0196 .0725 .1939	.0109	.0112	.0122 .0125 .0101 .0240 9000 .1017 .1559	.0130	.9162	.0159	.0132		.91%6 .01%6 .01%6 .0206 .0475 .09%6 .1418	5 .014 5 5 9 9 9 8 8 8 0	6 <del>9</del>	. 106
THETA .000 22.500 45.008 67.500 90.000 112.500 135.000 157.500 160.000	. <b>2%</b> 2	.0529 .0709 .1791 .3466	.0510 .0324 .0356 .0711 .1274 .2042 .2405 .3392	.0249 .0198 .0725 .1939 .2571	.0109	.0112	.0122 .0125 .0101 .0240 9000 .1017 .1559 .2003	.0130	.9162	.0159 .0088 .0443 .1361 347	. 1762	. 1710 . 8 <b>9</b> 47	.9146 .0196 .0136 .0206 .0475 .0946 .1646 .1916	5 .014 5 5 5 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	69 62 78	. 106
TH€TA .000 22:500 45:000 67:500 90:000 112:500 135:000 157:500 160:000 X/L	<b>.2982</b> . <b>5112</b> .	.0529 .0709 .1791 .3466 .4312	.0519 .0324 .0356 .0711 .1274 .2042 .2405 .3392	.0249 .0196 .0725 .1939 .2571	.0109	.0112	.0122 .0125 .0101 .0240 9000 .1017 .1559 .2003	.0130	.1714	.0159 .0060 .0443 .1361	.0132	. 1710	.9146 .0190 .0190 .0201 .0201 .0471 .1418 .1640	5 .014 5 5 5 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	69 62 78	.196
TH€TA .000 22.500 45.008 67.900 90.000 112.500 135.000 157.500 160.000	. <b>2%</b> 2	.0529 .0709 .1791 .3466	.0510 .0324 .0356 .0711 .1274 .2042 .2405 .3392	.0249 .0198 .0725 .1939 .2571	.0109	.1785	.0122 .0125 .0101 .0240 9000 .1017 .1559 .2003 .2033	.0130 .2072 .8505	.1714	.0159 .0088 .0443 .1361 347	. 1762	. 1710 . 8 <b>9</b> 47	.9146 .0196 .0136 .0206 .0475 .0946 .1646 .1916	5 .014 5 5 5 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	69 62 78	.530



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LARC UPHT 1115 (SH-12F), SRB HITHOUT B. L. TRIP (RHADON)

ALPHA ( 5) . 40.000 MACH ( 1) . 3.700

SECTION (	13 <b>570</b> (	aft stin	G MT)		DEPENDE	NT VARIA	BLE H/HR	EF							
X/L	.5412	.5523	.7246	.7357	.7467	.7866	.7776	.8505	.8616	.8726	. 8837	.8947	.9056	.9278	.9499
THETA															
45.000	.0103				.0103	.0075						.0109		.0196	.0188
67.500	.0204														.0508
90.000	.0477					.0880						. 0858		. 1520	. 1463
112.500	.0919														.28-9
135.000	. 1389				.4132	.2721						.2217		.5061	.4190
157.500	.1771														.5698
190.000	. 1873	. 1930	. 3352	.5060	.6908	.4024	.4793	.2947	.3199	. 2939	.3148	.2814	.3713	.7090	.6301

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(RHA005) 1 06 JUN 75 1 LARC UPNT 1115 (SH-12F), SRB HITHOUT B. L. TRIP

	REFE	RENCE DAT	'A								(	PARAMETRIC	DATA		
LREF -	836.8006 142.0000 142.0000	INCHES	XHRP • YHRP • ZHRP •		0000 INCH	ES				BET MOD		.000 1.000	RN/L	• 3	3. <del>5</del> 00
ALPHA ( 1)		)000 HV	<b>К</b> СН (1)	• 3	.700	RN/L	•	3.452	HREF .	. 056	PO	- 6980	. 800	TO -	714.000
SECTION (	11 <b>5RB</b> (/	FT STING	нт)		DEPENDEN	T VARIAE	LE H/H	REF							
X/L	.0265	.0495	.0972	.1193	. 1303	. 1789	. 1900	.2010	. 3336	. 3446	. <b>35</b> 57	.4206	.4317	.4427	.5302
THETA		.1567	.0897	.0496	.0203	.0213	.0219	.0197	.0132	.0142	.0128		.0134	.0135	.0115
.000 22.500		. 1'30 /	.0037	.0490	.0203	.0613	.0226	.0157	.0132	,0116	, , , ,		.0144		
45.000		. 1103	.0929	.0520			.0236			.0101			.0166		
67.500			.0983				.0240						.0276		
90.000	. 1456	.1121	.0898	.0508			.0178			. 0397			. 0596		
112.500		*****	.0934				.0252						. 0557		
135.000		. 1144	.0842	. 0557			.0239			.0185			0271		
157.500		•••	.0911				. 0235						.0149		
180.000		. 1095		.0543	1150.	.0213	.0216	.0206	.0129	.6140	.0120	.0123	.0133	.0134	.0114
X/L	.5418	.5523	.7246	.7357	. 7467	. 7666	.7776	. 8505	.8816	. 8726	.8837	. 8947	. 9058	.9278	.9499
THETA															
.000	.0129	.0130	. 0928	. 1123	.1076	.0695	. 0889	. 0765	.0739	.0754	. 0735	.0598	.0879	. t <b>659</b>	.1847
22.500	.0142														.1014
45.000	. 0229				. 1027	. 0590						.0795		. 1742	. 1800
67.500	.0541														. 1766
90.000	.0712					. 0879						.0701		. 1558	. 1679
112.500	.0694														.1615
135.000	.0471				. 1221	.0672						.0744		. 1673	. 1679
157.500	.0200									0000	.0727	.0663	.0847	. 1660	. 1909 . 1798
180.000	.0134	.0132	.0872	. 1047	. 1036	. 0649	. 0789	.0721	. 0756	. 0687	.urer	.0003	.0047		
ALPHA ( 2)	- 8.0	)00 M	CH ( 1)	- 3	.700	RN/L	•	3.539	HREF .	. 056	PO	- <del>699</del> 0.	. 300	TO -	702.000
SECTION (	11578 (/	FT STING	HT)		DEPENDEN	T VARIA	LE H/H	REF							
X/L	. 0265	.0495	.0972	. 1 193	. 1 303	. 1789	. 1900	.2010	. 3336	. 3446	. 3557	.4206	.4317	.4427	.5302
THETA															
.000		S+20.	.0406	.0262	.0114	.0121	.0129	.0129	.0421	. 0502	. 0495		.0708	. 07 <del>50</del>	. 0873
22.50			.0527				.0099						.0558	_	
45.000		. 0935	.0970	.0513			.0130			.0097			.0278		
67.500			.1275				. 0236						.0146		
90.000	. 1754	.1372	. 1228	.0571			.0205			. 0266			.0244		
112.500			.1307				.0418						0387		
135.000		.1777	. 1339	.0840			. 0508			.0438			.0477		
157.500		•	. 1591				.0544						.0492		



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LARC UPHT 1115	(SH-12F).	SRB WITHOUT B. L.	TRIP	(RHA005)

ALPHA ( 2) = 8.000 MACH ( 1) - 3.700

SECTICA	C 11588 (A	ET STING	3 MT)		DEPENDE	NT VARIA	BLE H/HF	REF							
X/L	. 0265	. 0495	. 0972	.1193	. 1 303	. 1789	. 1900	.2010	. 3336	. 3446	. 3557	.4206	.4317	.4427	.5302
THE TA															
180.000		. 1874		.0912	. 0500	.0503	. 0522	. 0530	.0475	.0531	. 0477	.0508	. 0544	. 0554	. 0513
X/L	.5412	.5523	.7246	.7357	.7467	.7666	.7776	. 9505	.9616	.8726	. 8837	.8947	. 9058	.9278	. 9499
THETA															
.000	.0919	. 0954	. 1207	. 1874	.2100	.0916	.0966	.0661	.0616	. 0623	. 0663	.0609	. 0997	. 2340	.2600
22.50 <b>0</b>	. C673														. 1915
45.000	. 0343				.0773	.0415						.0767		. 1504	. 1231
67.500	.0165											0755		. 1819	. 1 <i>3</i> 49 . 1946
90.000	0515					.0460						. 0756		. 1013	. 2273
112.500	.0368					0000						. 1006		.2793	. 2685
135.000	.0476				. 1764	. 0688						. 1000		.2193	. 3176
157.500 180.000	. 0537 . 0551	. 0568	. 1398	. 1859	.2250	.0953	. 1214	. 1267	. 1312	.1198	. 1278	.1105	. 1446	.3317	. 3364
, = - · · · ·															
ALPHA 1 3	) • 15.0	000 N	ACH ( I	1 = 3	.700	RN/L	•	3.536	HREF •	. 056	PO	• 6990	. 300	10 •	703.000
SECTION	C 11589 (/	FT STING	S MTI		OEPE-OE	NT VARIA	BLE H/HF	REF							
X/L	.0265	. 0495	.0972	.1193	. 1303	. 1789	. 1900	.2010	. 3336	. 3448	. 3557	.4206	.4317	.4427	.5302
THETA															
.000		.0470	.0392	. 0257	.0422	. 0468	.0557	.0501	. 0450	.0591	. 0554		. 0634	. 0649	.0548
22.500			.0401				.0241						. 0430		
45.000		.0019	.0649	. 0341			.0130			.0122			1150.		
67.500			. 0954				. 0233						.0149		
90.000	. 1950	. 1495	. 1205	. 0581			.0241			.0275			. 0274		
112.500			. 153 >				.0536						.0462		
135.000		. 2523	. 1579	. 1061			. 0693			. 0562			. 06 30		
157.500			. 1966				.0791						. 0693		
180.000		. 2438		. 1248	.0707	.0718	.0774	. 0783	. 0672	. 0724	. 0682	.0717	. 0782	TRE's	. 0739
X/L	.5412	.5523	.7246	.7357	.7467	.7666	.7776	. 8505	.8616	. 8726	. 8837	.8947	.9019	.9i.	. 9499
THETA															
.000	.0593	.0588	.1070	. 1337	. 1390	.0619	. 0653	. 0638	. 0564	. 0531	.0473	. 0378	. 3575	. 15T	.2045
22.500	.0384														. 1650
45.000	. 0243				.0700	.0387						. 0508			. 0952
67.500	.0178														.0953
90.000	.0280					1540.						.0498		. 1370	. 1585
112.500	.0458														.2491
135.000	.0643				. 2213	. 1181						. 1399		. 3606	. 3476
157.500	.0781														. 4390
180.600	.0809	.0933	. 1919	. 2769	. 3209	. 1611	. 1905	. 1762	. 1971	. 1698	. 1816	. 1640	.2163	.4712	.4717



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(RHn005) LARC UPHT 1115 (SH-12F), SRB HITHOUT 9. L. TRIP - 709.000 RN/L = 3.466 HREF = .056 PO - 6958.700 to ALPHA ( 41 - 30.000 MACH ( 1) - 3.700 DEPENDENT VARIABLE H/HREF SECTION ( 1) SRB (AFT STING HT) .5302 .4427 . 1789 . 1900 .2010 . 3336 . 3446 . 3557 .4206 .4317 .1193 .1303 .0495 . 6972 THETA .0268 .0191 . 0323 .0321 .0197 .0268 .0277 .0239 .0174 .0/16 .0624 .0331 .0169 .000 .0440 .0222 .0267 22.500 .0194 .0141 .0489 .0231 .0170 45.000 .0814 .0193 .0250 67,500 .0906 .0394 .0365 .0334 90.000 .2269 .1743 .1254 .0675 .0759 .0902 . 1968 112.500 .1106 .1006 .3103 .2109 . 1629 .1139 135.000 . 1364 . 1249 157.500 . 2926 . 1297 . 1518 . 1352 .1388 .1244 .1420 . 1330 . 1308 . 1457 .2076 . 1209 . 1224 180.000 . 3658 .9058 .9278 .9499 .6837 .8947 . 8726 .5412 .5523 .7248 .7357 .7467 .7666 .7778 .8505 .8616 X/L THETA .0420 .0387 .0200 .0235 17د0. . 0533 .0529 1 250. .0 ^ . .0323 .0296 .0205 .0246 .000 .0298 .0292 .0374 *2*2.500 . 0223 .0330 . 0209 . 0384 45.000 .0162 . CE90 1550. . 9799 67.500 .0191 .0760 . 1762 .1803 .0737 90.000 .0418 . 3248 .0761 112.500 .5034 .2452 .5546 .4139 .2514 135.000 .1114 .6795 157.500 . 1390 .7435 .7595 .6877 . 3800 .4316 . 3231 .3100 .3396 .2990 . 3906 .3312 180,000 . 1462 . 1521 - 7008.200 - 703.000 HREF .057 PO MACH ( 1) = 3.700 RN/L 3.544 ALPHA ( 5) - 40.000 SECTION ( 1) SRB (AFT STING MT) DEPENDENT VARIABLE H/HREF . 1900 .2010 . 3338 . 3446 . 3557 .4206 .4317 .4427 .5300 . 1789 X/L .0495 .0972 .1193 . 1303 THETA .0192 .0202 .0213 .0190 . 0221 .0253 .0280 .0207 .000 .0835 .0711 .0300 .0199 .0200 .0237 .0191 *2*₹.500 .0368 .0192 .0175 .0116 . 8151 .0743 .0390 45.000 .0213 .0202 67.200 .0546 .0780 -.9000 .0507 90.000 .2036 .2765 . .1095 .1168 112.500 . 1650 .1813 . 1572 2.70 .4223 .2149 135.000 . 1855 .2306 157.500 .2225 .2007 .2161 .2061 .2340 . 2071 .2265 .5323 , '859 .2031 .2294 .2397 180,000 .9499 . 9505 .8516 . 8726 .8837 .9058 . 9278 .7776 .7357 .7467 .7866 X/L .9412 .5523 .7246 THETA .0333 .0289 .0292 .0232 .0304 .0333 .0285 .0205 .0090 .0098 .0199 .0185 .0313 .0238 .0183 .000 . 0239

22 500

.0195



DATE 06 JUN 75 TABULATED DATA - SHIEF PAGE 13

LARC (PHT 1115 (SH-12F), SRB WITHOUT B. L. TRIP (RHA005)

ALPHA ( 5) = 40.000 MACH ( 1) = 3.700

THEMOTHAY THE HAMPE SECTION ( 1) SRB (AFT STING MT)

X/L	.5412	. 5523	.7246	.7357	7467	.7668	.7776	. 8505	.8516	.8726	.9837	. 8947	. 9058	. 9278	. 9499
THETA															
45.000	.0162				. 0226	.0132						.0214		.0282	.0241
67.500	. 0261														.0785
90.000	. 0580					.0837						.0890		.2139	.2117
112.500	.1081														. 3978
: 35.000	. 1632				.7311	. 3650						. 3311		.7955	.6350
					. /311	. 3030						. 3311			
157.500	.2063														. 91 <i>2</i> 8
190.000	.2194	O <b>C</b> 55.	.4668	1.1275	1.5467	. 5508	.9517	.4721	.5121	. 4238	. 4808	.40E.	.5601	1.1472	1.0404



DATE 05 JUN 75 TABULATED DATA - SHIEF PAGE 14

LARC UPMT 1115 (SH-12F), SRB WITHOUT B. L. TRIP (RHA00B) ( 08 JUN 75 )

	REFE	RENCE DAT	TA.								1	PARAMETR	C DATA		
SREF • 15 LREF • BREF • SCALE •	9936.8000 142.0000 142.0000	INCHES	XMRP (	• .	0.00 INCH 0000 INCH 0000 INCH	ES				BE T	A •	. 000 . 000	RN/L	•	1.500
ALPHA ( 11	- 60.0	000 m	NCH ( 1	• 3	.700	RN/L	•	1.534	HREF -	.037	PO	- 3007	7.100	TO •	700.000
SECTION (	1) SR8 ((	CTR STING	MT)		DEPENDEN	T VARIAE	SLE H/H	REF							
X/L	. 0265	.0495	. 0972	. 1 193	. 1303	. 1789	. 1900	.2010	. 3336	. 3448	. 3557	. 3667	.7136	.724E	. 7357
THETA															
.000	.0727		.0376	. 0219	.0164	. 0097	.0101	.0092	.0127	.0135	.0154	.0149	. 0090	. 00 <b>69</b>	. 0052
22.500			.0184				.0102			.0142			.0103		
45.000		.0491	.0195	.0100			.0089			.0125			. 0093		
67.500			.0480				.0200			.0232			.0192		
90.000	.2322	. 1380	.1085	. 0725			. 0540			. 0655			. 0365		
112.500			. 1964				. 1188			. 1362			. 0897		
135.000		. 3827	.3003	.2379			. 1969			. 1926					
157.500			.4126				.2751			. 2904			. 1830		
180.000	.6234	.5221	.4482	. 3523	. 3357	.2738	1562	.2772	.3156	. 3066	. 3086		.2067	. 2493	.4741
X/L	.7467	.7666	.7776	. 8505	.8816	.8726	. 6837	.8947	. 9058	.9278	.9389	.9499	.9718	. 9809	
THETA															
.000	.0032	.0093	.0057	.0191	.0214	.0214	.0218	.0179	.0136	. 0084	.0077	.0116	. 0066	. 0235	
22.500			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,									.0115			
45.000	.0161	.0039						.0158		.0129		.0138	.0060	. 0098	
57.500	.0101	.0035										. 0444			
∌0.000	. 1464	.0564						. 0625		. 1390		.1177	.0047	. 0208	
112.*00	. 1707	.0301										. 1923			
135	4036	.2248						.2200		.4577		.2920	.0049	. 0579	
157 700	7036	.6640										.4006			
180.000	.6056	. 3650	.7179		. 3343	. 3385	. 3296	.3325	.4419	.6143	.5320	.4451	.0058	. 1046	
ALPHA ( 2)	- 75.0	100 MA	CH ( 1)	• 3	.700	RN/L	•	1.503	HREF -	.037	PO	- 3015	.500	10 -	709.000
SECTION (	11SRB (C	TR STING	HT)		DEPENDEN	YARIAS	LE H/HF	EF							
X/L	. 0265	. 0495	.0972	.1193	. 1 303	. 1789	. 1900	.2010	. 3336	. 3446	. 3557	. 3667	.7136	.7248	. 7357
THETA															
.000	.0509		.0177	.0150	.0127	. 0099	.0121	.0108	. 0092	.0088	.0096	. 0102	. 0061	. 0060	. 0043
22.500			.0145				.0113			.0090			. 0074		
45.000		.0303	.0166	.0150			.0103			.0099			.0082		
87.500			.0411				.0231			. 0269			.0217		
90.000	.2164	. 1 300	. 0999	.0760			.0632			.0767			. 0444		
112.500			. 1928				.1341			5+4			. 1077		
135.000		.3675	. 3013	. 2587			. 2166			. 2245					
137.500			,4209				. 3068			. 3333			.2171		
137,300															







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(RHA006)

DATE 06 JUN 75 TABULATED DATA - SHIEF

LARC UPHT 1115 (SH-12F), SRB HITHOUT B. L. TRIP

ALPHA ( 2) = 75.000 MACH ( 1) = 3.700

500	1)SR8 (0	TR STIN	3 MT)		DEPENDEN	ALFRAY TH	BLE H/HR	EF							
X/L	. 0265	. 0495	.0972	. 1193	. 1303	. 1789	. 1900	.2010	. 3336	. 3446	. 3557	. 3667	.7138	. <i>72</i> 46	.7 <i>5</i> 57
THETA															
180.000	. 5685	.5081	.4652	.4017	. 3795	. 2946	. 3209	. 2999	. 3577	. 3451	. 3478		. 2430	.2807	. 2990
X/L	.7467	.7666	.7776	. 8505	.8616	. 8726	. 8837	.8947	. 9058	.9278	. 9389	. 9 <b>49</b> 9	.9718	, 980 <b>9</b>	
THETA															
.000	.0019	.0070	.0014	.0189	. 0208	.0198	.0170	.0132	.0121	.0137	.0167	.0196	.0093	. 0238	
22.500												.0166			
45.000	. 0075	.0023						.0125		.0106		.012 <del>9</del> .0276	.0087	.0126	
67.500								. 0698		.0773		.0276	.0097	.0462	
90.000	.0749	. 0684						. 0036		.07/3		.1300	.005	.0400	
112.500 135.000	.2402	. 3300						.2114		. 2268		. 1935	.0120	. 1301	
157.500	.2406	. 3300										.2547			
180.000	.3700	.4893	.4817		.2851	.2905	.2967	. 2031	.290!	. <b>2933</b>	.2974	.2773	.0132	.2165	
	- 00 4	W	ACH ( I		.700	RN/L	•	1.551	HREF -	. 037	PO	- 3019	5.400	10 -	695.000
ALPHA ( 3)	• 90.0	טטי,	ACH C I	, - 3	. 700	1047 C	_	1.551	ringr =	.03.	. •				***************************************
SECTION (	1)SR8 (C	TR STING	MTI		DEPENDE	IT VARIA	BLE H/HR	EF							
X/L	.0265	. 0495	.0972	. 1 193	. 1303	. 1789	. 1900	.2010	. 3336	. 3446	. 3957	. 3667	.7136	.7246	.7357
THETA															
11.45															
.000	.0307		.0098	.0087	.0076	.0115	.0110	.0136	.0044	.0054	. 0058	.0066	.0069	.0000	.0064
	.0307		.0091		. 0076	.0115	.0130	.0138	.0044	.1058	.0058	.0066	.0060	.0000	.0064
.000 22.500 45.000	.0307	.0227	.0091 .0101	.0087	. 0076	.0115	.0130 .0103	.0136	.0044	.1058 .0068	.0058	.0066	.0060 .0048	.0000	.0064
.000 22.500 45.000 67.500			1000. 1010. <b>205</b> 0.	.0116	.0076	.0115	.0130 .0103 .0215	.01 <b>36</b>	.0044	.058 .0068 .0231	.0058	.0066	.0060 .0048 .0194	.0000	.0064
.000 22.500 45.000 67.500 90.000	.1667	.0227	.0091 .0101 .02 <b>62</b> .0761		.0076	.0115	.0130 .0103 .0215 .0598	.0136	.0044	.058 .0068 .0231 .0717	.0058	.0066	.0060 .0048 .0194 .0454	.0080	.0084
.000 22.500 45.000 67.500 90.000		.0944	.0091 .0101 .0262 .0761 .1558	.0116	.0076	.0115	.0130 .0103 .0215 .0598 .1291	.0136	.0044	.058 .0068 .0231 .0717	.0058	. 0066	.0060 .0048 .0194	. 0080	.0064
.000 22.500 45.000 67.500 90.000 112.500			.0091 .0101 .0262 .0761 .1558	.0116	. 9076	.0115	.0130 .0:03 .0215 .0598 .1291 .2078	.01 <b>38</b>	.0044	.058 .0068 .0231 .0717 .1496	.0058	.0966	.0060 .0048 .0194 .0454		.0064
.000 22.500 45.000 67.500 90.000		.0944	.0091 .0101 .0262 .0761 .1558	.0116	. 9076	.0115	.0130 .0103 .0215 .0598 .1291	.01 <b>38</b>	.0044	.058 .0068 .0231 .0717	.0058	.0966	.0060 .0048 .0194 .0454 .1155		. 0064
.000 22.500 45.000 67.500 90.000 112.500 135.000 157.500	. 1667 . 4728	. 3058	.0091 .0101 .0282 .0761 .1558 .2494 .3498	.0116 .0652 .2427	.3501	.2930	.0130 .0103 .0215 .0598 .1291 .2078			.058 .0068 .0231 .0717 .1496 .2131		. 0066	.0060 .0048 .0194 .0454 .1155	. 3007	
.000 22.500 45.000 67.500 90.000 112.500 135.000	. 1667	. 3058	.0091 .0101 .0262 .0761 .1558 .2494	.0652			.0130 .0103 .0215 .0598 .1291 .2078 .2650	. 2 <del>95</del> 9	. 3571	.058 .0068 .0231 .0717 .1498 .2131 .3260 .3406	.3418		.0060 .0048 .0194 .0454 .1155	. 3007	
.000 22.500 45.000 67.500 90.000 112.500 135.000 157.500	. 1667 . 4728	. 3058	.0091 .0101 .0282 .0761 .1558 .2494 .3498	.0116 .0652 .2427 .3909	. <b>3591</b> . 9616	.2 <b>93</b> 0 .878 .	.0130 .0103 .0215 .0598 .1291 .2078 .2950 .3077	. 2959 . 8947	. 3571 . 9058	. 058 . 0069 . 0231 . 0717 . 1496 . 2131 . 3260 . 3406	.3418 .9399	. 9498	.0060 .0048 .0194 .0454 .1155 .2422 .2742	.3007 .9809	
.000 22.500 45.000 67.500 90.000 112.500 135.000 157.500 180.000	. 1667 . 4728	. 3058	.0091 .0101 .0282 .0761 .1558 .2494 .3498	.0116 .0652 .2427	.3501	.2930	.0130 .0103 .0215 .0598 .1291 .2078 .2650	. 2 <del>95</del> 9	. 3571	.058 .0068 .0231 .0717 .1498 .2131 .3260 .3406	.3418	.94 <b>99</b> .012 <b>5</b>	.0060 .0048 .0194 .0454 .1155	. 3007	
.000 22.500 45.000 67.500 90.000 112.500 135.000 157.500 180.000 X/L  THETA .000 22.500	.1667 .4729 .7407	.0944 .3058 .4274 .7666	.0091 .0101 .0262 .0761 .1558 .2494 .3498 .3968	.0116 .0652 .2427 .3909	. <b>3591</b> . 9616	.2 <b>93</b> 0 .878 .	.0130 .0103 .0215 .0598 .1291 .2078 .2950 .3077	. 2959 . 8947 . 0149	. 3571 . 9058	. 058 . 0088 . 0231 . 0717 . 1496 . 2131 . 3260 . 3406 . 9278	.3418 .9399	.9498 .012 <b>8</b> .0124	.0060 .0048 .0194 .0454 .1155 .2422 .2742 .9718	.3007 .9809 .0456	
.000 22.500 45.000 67.500 90.000 112.500 135.000 157.500 180.000  X/L  THE TA .000 22.500 45.000	.1667 .4728 .7407	.0944 .3058 .4274 .7666	.0091 .0101 .0262 .0761 .1558 .2494 .3498 .3968	.0116 .0652 .2427 .3909	. <b>3591</b> . 9616	.2 <b>93</b> 0 .878 .	.0130 .0103 .0215 .0598 .1291 .2078 .2950 .3077	. 2959 . 8947	. 3571 . 9058	. 058 . 0069 . 0231 . 0717 . 1496 . 2131 . 3260 . 3406	.3418 .9399	.9498 .0128 .0129	.0060 .0048 .0194 .0454 .1155 .2422 .2742	.3007 .9809	
.000 22.500 45.000 67.500 90.000 112.500 135.000 157.500 180.000  X/L  TH€TA .000 22.500 45.000 67.500	.1667 .4728 .7407 .0035	.0944 .3058 .4274 .7666 .0034	.0091 .0101 .0262 .0761 .1558 .2494 .3498 .3968	.0116 .0652 .2427 .3909	. <b>3591</b> . 9616	.2 <b>93</b> 0 .878 .	.0130 .0103 .0215 .0598 .1291 .2078 .2950 .3077	.2959 .8947 .0149	. 3571 . 9058	. 058 . 0089 . 0231 . 0717 . 1496 . 2131 . 3260 . 3408 . 9279	.3418 .9399	.9498 .0128 .0124 .0129	.0060 .0048 .0194 .0454 .1155 .2422 .2742 .9718	.3007 .9809 .0456 .0265	
.000 22.500 45.000 67.500 90.000 112.500 135.000 157.500 180.000  X/L  THETA .000 22.500 45.000 67.500 90.000	.1667 .4729 .7407	.0944 .3058 .4274 .7666	.0091 .0101 .0262 .0761 .1558 .2494 .3498 .3968	.0116 .0652 .2427 .3909	. <b>3591</b> . 9616	.2 <b>93</b> 0 .878 .	.0130 .0103 .0215 .0598 .1291 .2078 .2950 .3077	. 2959 . 8947 . 0149	. 3571 . 9058	. 058 . 0088 . 0231 . 0717 . 1496 . 2131 . 3260 . 3406 . 9278	.3418 .9399	.9499 .0128 .0124 .0129 .0211	.0060 .0048 .0194 .0454 .1155 .2422 .2742 .9718	.3007 .9809 .0456	
.000 22.500 45.000 67.500 90.000 112.500 135.000 150.000  X/L  THETA .000 22.500 45.000 87.500 90.000 112.500	.1667 .4728 .7467 .0035 .0043	.0944 .3058 .4274 .7666 .0034 .0014	.0091 .0101 .0262 .0761 .1558 .2494 .3498 .3968	.0116 .0652 .2427 .3909	. <b>3591</b> . 9616	.2 <b>93</b> 0 .878 .	.0130 .0103 .0215 .0598 .1291 .2078 .2950 .3077	.2859 .8947 .0149 .0100	. 3571 . 9058	. 058 .0068 .0231 .0717 .1498 .2131 .3260 .3406 .9279	.3418 .9399	.9499 .0128 .0124 .0129 .0211 .0660	.0060 .0048 .0194 .0454 .1155 .2422 .2742 .9718	.3007 .9809 .0456 .0265	
.000 22.500 45.000 67.500 90.000 112.500 135.000 157.500 180.000  X/L  THETA .000 22.500 45.000 67.500 90.000	.1667 .4728 .7407 .0035	.0944 .3058 .4274 .7666 .0034	.0091 .0101 .0262 .0761 .1558 .2494 .3498 .3968	.0116 .0652 .2427 .3909	. <b>3591</b> . 9616	.2 <b>93</b> 0 .878 .	.0130 .0103 .0215 .0598 .1291 .2078 .2950 .3077	.2959 .8947 .0149	. 3571 . 9058	. 058 . 0089 . 0231 . 0717 . 1496 . 2131 . 3260 . 3408 . 9279	.3418 .9399	.9499 .0128 .0124 .0129 .0211	.0060 .0048 .0194 .0454 .1155 .2422 .2742 .9718 .0395	.3007 .9809 .0456 .0265	



LARC UPNT 1115 (SH-12F), SRB WITHOUT B. L. TRIP (RHADD6)

				LAH	C UPWY 1	112 (24-	1671, 37	טרויות פו	O' B. L.	inte		T TATALA	,		
ALPHA ( 4)	- 105.	000 M	ACH ( I	) - 3	700	RN/L	•	1.511	HREF =	. 037	PO	- 301	2.000	TO -	707.000
SECTION (	1) SRB (	CTR STIN	B MT)		DEPENDE	NT VARIA	BLE H/HR	EF							
X/L	. 0265	. 0495	.0978	. 1193	. 1303	. 1789	. 1900	.2010	. 3336	. 3446	. 3557	. 3667	. 71 36	.7246	.7357
THETA															
. 000	. 0309		.0213	.0131	. 0095	. 0057	9000	. 0042	. 3071	. 0060	. 0056	.0039	.0051	. 0051	. 0052
22.500			.0184		•		.0047			. 0060			.0048		
45.000		.0218	.0161	.0112			.0066			. 0082			.0068		
67.500			.0232				.0213			. 0252			.0295		
90.000	. 1070	.0536	. 0544	. 0641			. 0580			.0681			. 0644		
112.500			.1077				.1124			. 1340			. 1606		
135.000		. 1767	. 1684	. 1937			.1758			. 1929					
157.500			.2278				. 2353			.2764			. 3382		
180.000	.2474	.2415	.2519	.2831	.2704	.2349	.2470	. 2228	. 3037	.2897	. 2757		. 3767		. 6898
	•••														
X/L	.7467	.7666	.7776	. 8505	. 6616	.8726	. 9837	. 8947	. 9058	.9278	. 9389	. 9499	.9718	.980′3	
THETA															
.000	.0044	.0159	.0159	.0146	.0128	.0116	.0104	.0086	.0082	.0074	. 0083	.0112	. 1238	. 0583	
22.500												.0118			
45.000	.0089	.0112						.0124		. 00 <del>99</del>		.0126	.1124	.0447	
67.500												. 0242			
90.000	.0879	. 0955						. 0828		. 0557		. 0747	. 1075	.0612	
112.500												. 1196			
135.000	.2876	.3104						. 3271		. 1908		. 1804	.1169	. 1492	
157.500												.2419			
180.000	.4902	.4365	.3418		. 3341	. 3651	.4176	.5054	.6134	2758	.2578	. 2659	. 1251	.2307	
ALPHA ( 5)	- 120.	000 M	ACH ( I	) • 3	.700	RN/L	•	1.525	HREF .	.037	PO	= 301	4.600	10 -	703.000
SECTION (	1 1)\$R8 (I	CTR STIN	S MT)		DEPENDE	NT VARIA	BLE H/HR	EF							
										5.4.5	****	7000	2120	7048	.7357
X/L	. 0265	.0495	. 0972	. 1 193	. 1303	. 1789	. 1900	. 2010	. 3336	. 3446	. 3557	. 3667	.7136	.7246	. /35/
THETA															
.000	. 0363		.0210	.0126	.0194	. 0052	. 0077	. 0066	.0083	.0071	. 0068	.0043	.0048		.0063
22.500			.0181				.0069			. 2076			.0058		
45.000		. 0252	.0166	.0131			. 0097			.0102			. 0085		
67.500			.0272				. 0257			. 02 <b>96</b>			. 0326		
90.000	.1048	. 0683	.0617	. 0693			.0635			. 0769			.0734		
112.500			. 1212				. 1224			. 1455			. 1019		
135.000		. 1695	. 1035	.2113			. 1922			.2160					
157.500			.2497				.2653			. 3191			.4030		
180.000	.2214	. 2239	.2781	. 3330	.3131	.2744	. 2921	. 2631	. 3654	. 3443	. 3238		. 4506	.7161	. 7679
X/L	.7467	.7666	.7775	. 8505	.9615	.8726	.8837	. 8947	.9.58	.9278	. 9389	. 9499	.9718	. 9909	
THETA															
. 000	. 0088	.0212	0203	.0160	.0146	.0139	.0119	.0101	. 0090	. 0005	.0039	.0149	. 1435	.0716	
22.500												. 0134			







DATE 06 JUN 75 TABULATED DATA - SHIEF PAGE 17

LARC UPHT 1115 (SH-12F), SRB HITHOUT B. L. TRIP (RHA006)

ALPHA ( 5) = 120.000 MACH ( 1) = 3.700

SECTION (	1158B (	CTR STIN	3 MT1		DEPENDE	NT VARIA	BLE H/HR	EF						
X/L	.7467	. 7668	.7776	. 8505	.8616	. 8726	.8837	.8947	.9058	. 9278	. 9389	. 9499	.9718	. 9809
THETA														
45.000	.0131	.0169						.0131		.0098		.0141	. 1302	. 0560
67.500												.0271		
90 000	. 0776	.1127						.0927		.0506		.0818	. 1230	. 0702
112.500												. 1362		
135.000	. 2996	. 3694						. 3829		1105.		.2034	. 1334	. 1586
157.500												.2673		
180.000	.4973	. 5292	.4257		.4043	.4522	. 5278	.6441	.7206	. 2924	.2814	.2881	.1415	.2416



DATE 08 JUN 75 TABLE ATED DATA - 1912F PAGE 18

LARC UPP 1115 (SH-12F), SRB WITHOUT B. L. TRIP (RHA007) ( 06 JUN 75 )

	REFE	RENCE DA	TA									PARAMETRI	C DATA		
SREF =   LREF = BREF =	15836.8000 142.0000 142.0000	INCHES	YMRP	• .	0000 INC	Æ\$				BE T MOO		.000 .000	RN/L	•	3.500
SCALE .	.0130	INCRES	State	•		~ 3									
ALPHA ( )	1) = 60.	000 M	ACH ( I	1 - 3	3.700	RN/L	•	3.627	HREF .	. 057	PO	- 7006	. 300	10	693.000
SECTION	( 1)588 (	CTR STIN	G MT)		DEPENDEN	IT VARIAE	LE H/H	REF							
X/L	.0265	.0495	.0972	. 1 193	. 1303	. 1789	. 1900	.2010	. 3336	. 3446	. 3557	. 3667	.7136	.7246	. 7357
THETA															
. 000	. 0642		. 0569	. 0295	.0343	.0134	.0133	.0122	.0119	.0139	.0154	.0156	. 0075	.0073	.0051
22.500			. 0359				.0121			.0132			.0094		
45.000		. 0439	.0233	.0199			. 0095			.0141			.0107		
67.500			.0467				.0176			. 0245			. 0200		
90.000	.2199	. 1334	. 1057	. 092 1			. 0545			. 0688			.0386		
112.500			. 1975				. 1226			. 1408			. 0949		
135.000		. 3848	. 2989	. 2728			. 1960			. 1896					
157.500			.4109				.2725			.2960			. 1868		6000
180.000	.6564	.5278	.4453	. 3553	. 3369	.2737	. 2086	. 2679	.3170	.3113	.3133		.2140	. 2744	. 6809
X/L	.7467	.7666	.7776	. 8505	.8616	.8726	.8837	.8 <b>9</b> 47	. 9058	. 9278	. 9389	. 9499	.9718	. 9909	
THETA															
. 000	.0035	.0100	.0058	. 0233	. 0273	.0308	.0339	.0308	. 0269	.0176	.0150	.0123	.0072	.0310	
22.500												.0122			
45.000	.0158	. 0052						.0195		.0150		.0148	.0051	.0112	
67.500												.0441			
90.000	. 1839	.0613						. 0638		. 1401		. ' 397	. 0065	. 0213	
112.500								20.35				. 2353 . 3764	.0082	. 0622	
135.000	. 5294	. 2552						.2575		.4969		.5/61	.0006		
157.500	.8158	.3710	. 8355		.4246	.4141	. 3879	. 3858	.4709	.6140	. 5593	.5639	.0099	.1412	
ALPHA I E	2) = 75.0	000 M	ACH (1	. 3	. 700	RN/L	•	3.509	HREF .	. 056	PO	• 6987	. 300	то -	706.000
				_											
SECTION	( 1)SRB (	CTR STIN	G MT)		DEPENDEN	IT VARIA	LE H/H	HEP							
X/L	.0265	.0495	.0972	. 1 1 <b>93</b>	. 1 303	. 1789	. 1900	.2010	. 3336	. 3446	. 3557	. 3667	.7136	.7246	.7357
THETA															
.000	. 0536		. 0425	. 0291	.0231	.0120	.0125	.0115	.0145	.0100	.0081	.0072	.0075	.0069	. 0053
22.500			.0340				.0168			.0094			. 0087		
45.000		.0446	. 0243	. 022 <b>8</b>			.0159			.0102			.0094		
67.500			.0466				.0275			.0308			.0237		
90.000	. 2293	. 1395	.1114	.0640			.0713			.0868			.0483		
112.500			.2141				. 1505			9			.1192		
: 35.000		.4121	. 3390	. 2925			.2433			•					
157 500			.4857				. 3409			. 3740			. 2330		

4...

DATE 06 JUN 75

190.000

.3045

TABLEATED DATA - SHIZE

LARC UPWT 1115 (SH-12F), SRB WITHOUT B. L. TRIP

(RHA007)

PAGE

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3.700 MACH ( 11 = ALPHA ( 2) - 75.000 DEPENDENT VARIABLE H/HREF SECTION ( 1) SRB (CTR STING MT) .7357 .7136 .7246 . 3667 . 1303 . 1900 .2010 . 3338 . 3446 . 3557 . 0972 .1193 . 1789 X/L . 0265 .0495 THETA .3212 .4031 .3947 . 3949 . 2658 . 3023 . 3609 . 3322 .5848 .5391 .4652 .4370 . 3329 180.000 .7125 .8837 . 8947 .9058 . 9278 .9389 .9499 .9718 .9809 . 8726 X/L .7467 .7666 .7776 . 6505 .8616 THETA .0152 . 0221 .0323 .0323 .0268 .0190 . 0294 .0180 .0032 .0227 .000 .0095 .0044 .0240 . 0259 .0245 22.500 .0183 .0183 .0146 .0160 .0172 45.000 .0117 .0031 .0302 67.500 .0769 .0834 0192 .0570 .0929 .1079 .1034 90,000 .1330 112,500 . 0223 . 1498 .2005 . 2299 . 2454 135.000 .2924 . 4144 .2681 157.500 .3397 .3215 . 3079 .2927 . 0244 .7613 . 2990 .3030 .3167 . 5653 180.000 .4341 .6212 - 703.000 - 6996.000 TO 3.540 .056 PO 3.700 RN/L MACH ( 1) -ALPHA 1 31 . 90.000 SECTION ( 1) SRB (CTR STING HT) DEPENDENT VARIABLE H/HREF .7357 . 3336 . 3446 . 3557 . 3667 .7136 .7246 .2010 .0977 .1193 . 1303 . 1789 . 1900 X/L .0265 .0495 THETA .0042 .0049 .0063 .0088 .0074 .0040 .0044 .0102 .0093 .0123 .0141 .0140 .0108 .0434 .000 . 0055 .0042 .0136 22.500 .0103 .0076 .0058 .0127 .0302 .0127 .0120 45.000 .0230 .0278 .0298 . 0362 67.500 .0491 . 0699 .0836 .1099 . 0898 .0762 .1745 90.000 . 1198 . 1670 .1718 .1397 112.500 . 2355 .2105 135.000 .3126 .2664 . 3452 . 2360 . 3025 157.500 . 3714 . 3060 . 3506 . 2662 .3169 .3105 . 2035 .3727 . 3547 . 3593 .2849 . 3865 180 200 . 4750 .4332 .4099 .9719 .9809 9058 .9278 .9389 .9499 . 8937 .B947 .7467 .7666 . 7776 . 8505 .9616 . 6726 X/L THETA .0127 . 0507 .0600 .0163 .0169 .0179 .0174 .0174 .0152 .0141 .0022 .0145 .0051 .000 .0042 1510. 22.500 .0122 .0106 .0135 .0499 .0316 .0067 .0016 45.000 .0232 67.500 .0667 .0699 .0503 .0671 .0621 90.000 .0707 .0692 .1185 112.500 . 1961 . 0572 .1943 . 1964 135.000 .2134 . 2206 .2144 . 2559 157.500 .0634 | 1.1578 .2698 .2793 . 2964 . 2958 . 3039 . 2558 . 2898 . 3000



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LARC UPHT 1115 (SH-12F), SRB MITHOUT B. L. TRIZ (RHA007)

ALPHA ( %)	- 105.0	900 W	NCH ( 1)	- 3	. 700	RN/L	•	3.407	HREF =	. 056	PO	• 6959	9.800	TO -	718.
SECTION (	1) SAB ((	TR STIN	) MT)		DEPENDE	T VARIAS	LE H/HR	EF							
X/L	. 0265	. 0495	. 0972	. 1 193	. 1303	. 1789	. 1900	.2010	. 3338	. 3446	. 3557	. 3667	.7136	.7246	. 735
THETA															
. 000	. 0386		. 0238	1050.	.0158	. 0064	.0053	. 0062	. 0069	. 0067	.0060	. 0051	. 0061	.0065	. 004
22.500			.0216				. 0059			.0063			.0064		
45.000		.0266	.0213	.0172			.0082			.0086			.0068		
67.500			.0422				. 0262			.0309			. 0245		
90.000	. 1430	.0899	. 0998	.0732			, D66':			.0790			. 0504		
112.500			. 1926				. 1313			. 1546			. 1221		
135.000		.2633	.3040	.2291			.2036			.2156					
157.500			.4178				.2714			. 3036			. 2469		
180.000	. 3637	. 3631	.4164	. 3329	. 3028	.2675	. 2765	. 2495	. 3326	.3142	. 3003		.2663	. 3588	. 49
X/L	.7467	.7668	.7776	. 8505	.8516	. 8726	. 8837	. 8947	. 9058	.9279	. 9389	.9499	.9718	. 9809	
THETA															
.000	.0031	.0112	.0045	. 0265	.0231	.0190	.0165	.0141	.0134	.0102	. 0097	.0106	.1199	. 0600	
22.500	.003.											.0110			
45.000	.0008	.0035						.0155		.0134		.0143	. 1080	. 0406	
67.500	.0000	.0033										. 0257			
	.0983	.0996						0751		.0627		.0706	.0997	. 0577	
90.000	. 0963	. 0000										. 1185			
112.500	.3431	.2697						. 2484		.2012		. 1847	.1048	. 1665	
135.000	. 3431	.6097										. 2550			
157.500 180.000	.5306	. 3323	.2427		. 2092	. 3049	.3241	. 3500	.4103	.2721	.2755	. 2794	.1109	. 2663	
ALPHA ( 5)	- 120.0	100 PV	VCH ( 1)	• 3	. 700	RN/L	•	3.554	HREF .	. 058	PO	- 6959	. 600	10 -	699
SECTION (	115RB (C	TR STING	HT)		DEPENDER	IT VARIAB	LE H/HR	EF							
X/L	. 0265	. 0495	. 0972	.1193	. 1303	. 1789	. 1900	.2010	. 3336	. 3446	. 3557	. 3667	. 71 36	. 7246	. 73
n/ L															
THETA														.0149	
. •	. 0269		.0147	.0118	.0100	.0077	.0109	. 0079	. 0099	. 0090	.0076	.0066	.0103		.017
THETA	. 0269		.0147 .0129	.0118	.0100	.0077	.0109 .0076	. 0079	.0099	.0078	. 0076	.0066	.0106		.013
THETA	. 0269	.0193		.0118	.0100	.0077	.0076 .0087	. 0079	.0099	.0078 .0107	.0076	.0066	.0106	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	.013
THETA .000	. 0269	.0193	.0129		.0100	.0077	.0076 .0087 .0282	. 0079	.0099	.0078 .0107 .0327	.0076	.006ñ	.0106 .0104 .0341		.015
ATETA .000 .22.500 45.000	.0269	.0193 .0683	.0129		.0100	.0077	.0076 .0087 .0282 .0794	. 0079	.0099	.0078 .0107 .0327 .0934	.0076	.0066	.0106 .0104 .0341 .0816		.01
THETA .000 22.500 45.000 57.500	- '		.0129 .0134 .0251	.0107	.0100	.0077	.0076 .0087 .0282	. 0079	.0099	.0078 .0107 .0327 .0934 .2062	.0076	.0066	.0106 .0104 .0341		.015
THE TA .000 22.500 45.000 67.500 90.000	- '		.0129 .0134 .0251 .0639	.0107	.0100	. 0077	.0076 .0087 .0282 .0794	.0079	.0099	.0078 .0107 .0327 .0934 .2062 .3296	.0076	.0066	.0106 .0104 14€9. 180. 1155.		.015
THETA .000 22.500 45.000 67.500 90.000	- '	. 0683	.0129 .0134 .0251 .0639	.01 <b>07</b> .0853	.0100	.0077	.0076 .0087 .0282 .0794 .1762	. 0079	. 00 <del>99</del>	.0078 .0107 .0327 .0934 .2062 .3298 .5633		. 006A	.0106 .0104 .01941 .0818 .1155.		
THE TA .000 22.500 45.000 67.500 90.000 112.500 135.000	- '	. 0683	.0129 .0134 .0251 .0839 .1341	.01 <b>07</b> .0853	.0100	.0077	.0076 .0087 .0282 .0794 .1762 .3153	. 9079	. 0099	.0078 .0107 .0327 .0934 .2062 .3296	.5660	.0066	.0106 .0104 14€9. 180. 1155.		1.016
THETA .000 22.500 45.000 67.500 90.000 112.500 157.500 159.000 160.000	.1185	. 0683	.0129 .0134 .0251 .0639 .1341 .2188	.0107 .0953 .3426			.0076 .0087 .0282 .0794 .1762 .3153 4973			.0078 .0107 .0327 .0934 .2062 .3298 .5633		. 9499	.0106 .0104 .01941 .0818 .1155.		
THETA .000 22.500 45.000 67.500 90.000 112.500 135.000 157.500	.1195	. 2300 . 3578	.0129 .0134 .0251 .0839 .1341 .2188 .3140	.0107 .0953 .3426 .6118	,5898	.5140	.0076 .0087 .0282 .0794 .1762 .3153 4973 .5293	. 4563 . 8947	.6543 .9058	.0078 .0107 .0327 .0934 .2062 .3296 .5633 .5903	.5660	. 9-99	.0106 .0104 .0341 .0818 .2211 .5222 .5949	.9677 .9809	
THETA .000 22.500 45.000 57.500 90.000 112.500 157.500 167.500	.1195	. 2300 . 3578	.0129 .0134 .0251 .0839 .1341 .2188 .3140	.0107 .0953 .3426 .6118	,5898	.5140	.0076 .0087 .0282 .0794 .1762 .3153 4973 .5293	. 4563	. 6543	.0078 .0107 .0327 .0934 .2062 .3296 .5833	.5660		.0106 .0104 .021 .0818 .2211 .5222	.9677	

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DATE 05 JUN 75 TABULATED DATA - SHIEF PAGE 21

LARC UPHT 1115 (SH-12F), SRB WITHOUT B. L. TRIP (RHA007)

ALPHA ( 5) = 120.000 PACH ( 1) = 3.700

SECTION (	t) \$88 (	CTR STIN	3 MT)		DEPENDE	NT VARIA	BLE H/HR	EF							
X/L	.7467	.7666	.7778	.8505	.8616	. 8726	. 8837	.8947	.9058	.9278	. 9389	.9499	.9718	. 9809	
THETA															
45.000	.0151	.0312						.0132		.0119		.0134	. 1530	. 0542	
67.500												.0261			
90.000	. 0956	. 1511						. 0923		. 0634		.0915	. 1467	. 0663	
112.500												. 1530			
135.000	. 3331	.4995						.4382		.2246		. 2455	. 1579	. 1621	
157.500												. 3485			
180.000	. 5609	. 6880	. 5925		.5745	. 5951	.6504	. 7505	. 8268	.3150	. 3149	. 3477	.1715	. 2538	

DATE 08 JUN 75 TABULATED DATA - SHI2F PAGE 22

LARC UPHT 1115 (SH-12F), SRB HITHOUT B. L. TRIP (RHA00B) ( 06 JUN 75 )

	REFE	RENCE DA	<b>ITA</b>								•	PARAMETR	C DATA		
SREF • 150	936.9000	SQ. IN.	XHRP (	• .	0000 INCH	ES				BET	A -	. 000	RN/L	•	3.500
•	142.0000		YMRP	•	0000 INCH	ES				MOD	EL •	2.000			
BREF .	142.0000	INCHES	ZMRP	• .	0000 INCH	€S									
SCALE .	.0130														
ALPHA ( 1)	- 60.	000	MCH [ ]	<b>, -</b> 3	3.700	RN/L	•	3.472	HREF -	. 056	PO	- 692	5.300	10	<b>70</b> 8.100
SECTION (	1)SRB (	TR STIN	O MTI		DEPENDEN	T VARIAE	LE H/HF	EF							
X/L	. 0265	.0495	.0972	.1193	. 1303	. 1789	. 1900	.2010	. 3336	. 3446	. 3557	. 3667	. 71 36	.7246	. 7357
THETA															
. 000	. 0840		9000	. 0233	.0241	.0181	.0173	.0 49	.0175	.0155	.0117	.0088	. 0053	. 0063	. 0050
22.500			.0329				.0138			.0153			. 0072		
45.000		. 0590	. 0261	.0193			.0123			. 0299			.0105		
67.500			.0515				. 0220			.0693			. 0233		
90.000	.2195	. 1393	. 1072	.0837			. 0553			.0790			. 0387		
112.500			. 1871				.1113			. 1279			.0816		
135.000		. 3442	.2728	.2240			. 1699			. 1705					
157.500			. <i>3</i> 80 I				.2275			.2407			. 1459		
180.000	.5118	.4431	. 3879	. 3078	. 2960	. 2098	. 2354	. 2254	.2453	. 2525	.2507		. 1545	. 2553	.4889
X/L	. 7467	.7668	.7776	. 8505	.9616	. 8726	.8837	1947	. 9058	.9278	.9389	. 9499	.9718	. 9809	
THETA															
.000	.0043	.0127	.0058	. 0223	. 0257	. 0298	.0315	. 0295	. 0274	.0178	.0158	.0133	. 0078	. 0285	
22.500												.0126			
45.000	.0215	.0049						. 0207		.0176		.0178	. 0073	.0127	
67.500												. 0528			
90.000	. 1722	.0948						. 0907		. 1479		. 1460	. 0074	.0241	
112.500												.2509		0711	
135.000	. 4667	. 3001						.2797		. 4909		. 3692 . 4.845	.0083	.07!1	
157.500 180.000	.6594	.4248	. 6099		. 3991	3993	. 3900	.4001	. 4885	. 5969	.5789	.5203	.0093	. 1702	
ALPHA ( 2)	• 75.0	300 P	MCH ( )	1	3.700	RN/L	•	3.549	HREF .	. 056	PO	• 695	s. <del>0</del> 00	TO .	- 700.000
						_									
SECTION (	1)SRB ((	CTR STIN	IG HT)		DEPENDEN	T VARIAS	LE H/HF	EF							
X/L	. 0265	.0495	.0972	. 1 193	. 1303	. 1789	. 1900	.2010	. 3 3 3 6	. 3446	. 3557	. 3667	.7136	.7246	. 7357
THETA															
.000	.0376		9000	.0182	.0166	. 0099	.0115	.0114	.0078	.0082	.0083	.0084	.0074	.0067	.0048
22 500			.0396				.0148		•	.0069			.0000		
45.000		.0356	.0241	.0245			.0150			.0213			.0081		
67.500		-	.0392				. 0226			.0754			. 0206		
90.000	. 1952	.1184	. 0949	.0721			.0614			. 0789			.0446		
112.500			. 1808				. 1302			. 1493			. 1092		
135.000		. 3516	E #85.	. 2469			.2079			. 2087					
157.500			. 3958				.2902			. 31 35			.2556		





DATE DE JUN 75 TABULATED DATA - SHIEF 23

LARC UPHT 1115 (SH-12F), SRB HITHOUT 9. L. TR(P (RHADDB)

ALPHA ( 2) = 75.000 MACH ( 1) = 3.700

				•											
SECTION (	CDSRB (	CTR STIN	G MT)		DEPENDE	T VARIA	BLE H/HF	EF							
X/L	. 0265	. 0495	. 0972	. 1193	. 1303	. 1789	. 1900	. 2010	. 3336	. 3446	. 3557	. 3667	. 71 38	.7246	. 7357
THETA															
180.000	. 5657	.4830	.4332	. 3826	. 3591	. 2962	. 3051	. 2847	. 3368	. 3296	. 3287		. 2406	.2679	. 2825
X/L	.7467	. 7666	.7776	.8505	.8616	. 8726	. 8837	.8947	. 9058	.9278	. 9389	.9499	.9718	.9809	
THETA															
.000 22.500	.0034	.0083	.0041	.0234	1450.	.0198	.0143	.0129	.0210	.0316	.0311	. 0250 . 0236	.0180	. 0289	
45.000	.0107	.0037						.0129		.0157		.0161	.0169	.0160	
67.500 90.000	.0911	. 0935						.0696		. 0777		. 0278 . 0788	.0186	. 0550	
112.500	.0311	.0353								-		. 1256			
135.000 157.500	.2593	. 3821						.2128		. 2292		. 1868 . 2516	. 0220	. 1447	
180.000	. 3839	. 5354	.4917		. <i>2</i> 659	.2721	.2752	. 2871	. 3129	. 2962	.2853	.2728	.0240	. 7370	
ALPHA 1 3	90.0	000 M	ACH ( 1	. 3	. 700	RN/L	•	3.521	HREF .	. 056	PO	- 6963	300	70 -	704.000
CECTION (	( 1)SR8 ((	-TD CT1M	0 451		DEBENDE	NT VARIAL	DIE 11/14	×c							
SECTION	וו פאכנו ו	LIN SIIN	<b>9</b> m,		DEFERDE	** ****	DEE HIVE	ver							
X/L	.0265	. 0495	.0972	. 1193	. 1303	. 1789	. 1900	.2010	. 3336	. 3446	. 3557	. 3667	.7136	.7246	.7357
THETA															
. 000	.0398		9000	.0169	. 3148	.0140	.0163	.0181	.0105	.0110	.0094	.0074	.0096		.0094
22.500			.0154				.0165			.0132			.0068		
45.000		. 0300	.0154	.0137			.0150			.0231			.0067		
67.500			.0362				.0277			. 0576			.0246		
90.000	. 1783	. 1097	. 0893	. 0759			. 0704			. 0874			.0498		
112.500			. 1725				. 1418			. i <b>683</b>			. 1214		
135.000		. 3222	. 2887	. 2508			. 2202			.2345					
157.500			. 3756				. 3047			. 3436			. 2483		
180.000	.4980	.4478	.4148	.4042	. 3743	. 2962	.3161	.2913	. 37 <del>50</del>	. 3598	. 3546		.2711	. 3077	. 3226
K/L	.7467	. 7666	.7776	. 8505	.8616	.8726	.6837	. 8947	. 9050	.9278	.9389	.9499	.9718	.9809	
THETA															
. 000	. 0059	.0064	. 0044	.0170	.0179	.0187	.019+	.0192	.0197	.0162	.0158	.0142	. 0527	.0614	
<i>22</i> .500												.0130	<b>-</b>		
45.000	. 0073	.0037						.0149		.0117		.0145	. 0507	.0341	
67.500												. 0252			
90.000	. 0696	. 0666						. 0705		. 0651		.0731	. 0509	. 068 (	
112.500												. 1235			
135.000	.2140	.2206						. 2230		.2012		. 1686	. 0564	. 1939	
157.500												.2577			
180.000	. 3035	.2913	. 3039		. 3041	. 3075	. 3056	. 3069	.3157	. 2609	.2743	.2601	. 0623	9000	

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DATE 06 JUN 75 TABULATED DATA - SHI2F PAGE 2N

LARC UPHT 1115 (SH-12F), SRB WITHOUT B. L. TRIP (RHADD9) ( 06 JUN 75 )

				LAN	C OPMI II	13 (34-)	ier, o	19 101111111111111111111111111111111111	J. U. C.	.,,,,,					
	REFE	RENCE DA	TA								ł	PARAMETRI	C DATA		
SREF - 15	836.8000	SQ. IN.	XHRP (		0000 INC	ES				861	'A •	. 000	RN/L	•	1 .500
	142.0000		YMRP		0000 INCH					MOC	EL .	3.000			
	142.0000		ZHRP		0000 INCH	€S									
SCALE -	.0130														
ALPHA ( 1)	- 140.0	000 M	ACH ( 1)	- 3	.700	RN/L	•	1.521	HREF .	.031	PO	- 3010	. 300	10 -	704.000
SECTION (	11588 (	NO STIN	G MTI		DEPENDEN	IT VARIA	BLE H/HF	ŒF							
X/L	. 1220	. 1331	. 1441	. 1795	. 1905	.2016	. 3297	. 3407	. 3510	.4203	.4313	.4424	. 5303	.5413	. 5524
THETA															
. 000	.0090	.0091	.0065	.0114	.0127	.0131	.0059	. 0065	.0063	.0114	.0131	.0126	.0147		. 01 35
22.500														1510.	
45.000		.0101			.0129			. 0098			.0114			.0115	
67.500											0500			. 0222 2020 .	
90.000		. 0583			. 0674			. 0699			. 0582			. 1196	
112.500					0202			.2314			. 2329			.1190	
135.000		. 2052			.2387			.2314			. 6369			. 3075	
157.500				3000	71.61.	71.00	. 3723	. 3523	. 3051	. 3632	. 3539	. 3375	. 3370		. 3099
180.000	.3166	.2874	.2010	. 3275	. 3464	. 3409	.3123	. 3523	. 3031	. 3036	. 3333	. 33, 3	. 3370	. 3333	
X/L	.7251	.7362	.7472	.7687	ררדר.	. 8506	.8617	.8727	.8838	.8948	. 9058	.9266	.9377	. 9467	.9726
THETA															
. 000	.0149	.0127	.0160	. 0200	. 0270	. 0333	. 0346	. 0349	9000	.0369	.0271	.0218	.0198		. 2680
22.500	.0171									. 0233				.0205	
45.000	.0160		.0116	. 0234						.0168		.0154		.0163	. 2547
67. <del>5</del> 00	.0390									.0308				.0244	24.40
90.000	.1053		.0911	. 1 101						.0702		. 0649		. 0575	.2416
112.500	. 2442									. 1306		. 1669		. 1166 . 1766	. 2345
135.000	. 3997		. 2657	.4181						.2209 .2787		. 1003		.2326	. 2343
157.500	.5116			5007	.4755	. 3038	. 3095	. 3094	. 3284	.3366	. 3275	.2218	. 2295	.2497	.2334
180.000	.4776	.4370	.4033	. <del>58</del> 93	ככיו ויי.	. 3036	. 3093	. 3094	. 3004	. 3300	. 36 75	.6619	.2633	.6437	.6354
X/L	.9910														
THETA															
. 000	. 0977														
22.500	. 0767														
45.000	. 0758														
67.500	.0954														
90.000	. 1341														
112.500	. 2094														
135.000	.2963														

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157.500 -.9000 180.000 .3687 <u>.</u>



DR JEN 79 TARILATED DATA - SHIPF PAGE 25

DATE DE J	N 75		TABULAT	ED DATA	- SHIEF									PAUL	6.5
				LAR	C UPHT 1	115 (\$4-1	IZF), SA	8 HITHO	UT 8. L.	TRIP		(RHA	0091		
ALPHA ( 2	- 150.0	000 H	ACH ( 1	3	.700	RN/L	•	1.502	HREF .	. 031	P0	• 3010	3.300	TO -	710.0
SECTION	( 1)5R8 (	NO STIN	G MT)		DEPENDE	NT VARIA	BLE H/HR	EF							
X/L	. 1220	.1331	.1441	. 1795	. 1905	.2016	. 3297	. 3407	.3518	.4203	.4313	,4424	.5303	.5413	. 5524
THETA															
.000	.0133	.0130	. 0092	.0153	.0169	.0172	.0203	.0190	.0171	.0211	.0212	. 0205	. 0235	.0246 .0189	. 0225
22.500					0163			.0161			.0196			.0186	
45.000		.0133			.0162			.0161			.0.60			.0227	
67.500		.0507			. 0554			. 054 1			. 0524			.0513	
90.000 112.500		. 0307			.0334			.05						. 1104	
135.000		. 1552			. 1958			. 1672			. 1959			. 1798	
157.500		. 1032												.2514	
190.000	. 2404	.2223	. 1598	. 2489	.2614	.2557	.2458	.2403	.2156	.2707	.2715	. 2628	. 2690	.2641	. 2495
							00.0	0727	.8838	.8948	.9058	.9268	.9377	.9487	.9726
X/L	.7251	.7362	.7472	.7667	ירדר.	.8506	.8617	.8727	.0636	סיפס.	. 9000	. 5000	. 5377	. 3401	
THETA															
. 000	. 0211	.0175	. 0237	. 0496	.0452	.0412	.0467	. 0504	9000	. 0520	. 0466	.0339	.0273	.0305 .0262	. 2220
22.500	. 0282									.0367		.0195		.0203	. 2025
45.000	. 0326		.0189	. 0292						.0263 .0413		.0183		. 0300	
67.500	.0348			0700						.0844		. 0590		. 0593	. 1711
90.000	. 0760		. 0575	. 0790						. 1350		. 0330		.0962	••••
112 500	.1712		1057	.2883						.1975		. 1594		. 1391	. 1631
135.000	.2767 .3536		. 1957	.2003						.2241				. 1936	
190.000	. 3439	.3213	.2015	.4052	. 3320	.2089	.2164	.2222	.2454	.2625	.2662	. 1975	.2018	.2158	. 1642
X/L	.9810														
THETA															
.000	. 1254														
22.500	.0969														
45.000	.09×B														
67.500	.1102														
90.000	.1410														
112.500	.2031														
135.000	.2675														
157.500	9000														
180.000	. 3226														

PAGE 26 DATE OS JUN 75 LARC UPHT 1115 (SH-12F), SRB HITHOUT B. L. TRIP (RHA009) - 3021.700 TO - 707.000 .037 PO MACH ( 1) - 7 700 RN/L - 1.516 HREF -ALPHA ( 3) . 170.000 DEPENDENT VARIABLE H/HREF SECTION ( 1) SRB (FND STING MT) . 5524 .4203 .4313 .4424 .5303 .5413 . 1331 . 1905 .2016 . 3297 . 3407 . 3519 . 1795 X/L . 1220 . 1441 THETA .0467 .0439 .0458 .0439 .0423 .0398 .0462 .0478 .0449 . 0456 .0427 .0463 .0391 . 0265 . 000 .0404 .0544 22.500 .0300 . 0235 .0260 .0236 45.000 . 0228

. 0228 .0204 . 0234 -.9000 90,000 .0218 .0421 112.500 .0594 .0582 .0652 .0556 135.000 .0585 .0717 157.500 .0633 .0731 .0730 .0720 . 0732 .0740 .0721 .0723 .0709 .0822 180.000 .0765 .0729 . 0526 .0779 .0935 .9058 . 9266 .9377 .9487 .9726 .0838 . 8948 .7251 .7362 .7472 .7667 .7777 . 8506 .8617 .8727 X/L THETA .0327 .1080 .0268 .0257 .0544 -.9000 .0550 .0453 0451 .0399 .0576 .0506 .0480 .0521 .0825 .000 .0334 .0483 22.500 .0662 .0270 .0390 .1012 .0560 .0562 .0329 . 0551 45.000 .0723 .0506 67.500 .0506 .0014 .0530 .0702 .0740 .0946 -.9000 90.000 1540. .1110 .0813 112.500 .0881 . 1309 . 0698 . 0824 .0699 135.000 .1064 .0702 . 1264 .1317 .0926 1: 500 . 1209 . 0976 . 0744 . 0755 .0689 .1112 .1220 . :415 . 1455 . 1291 . 1365 . 1122 . 0999 .1157 .0948 .0831 1ED.000

.9610 X/L

67,500

THETA .000 ...'803 22.500 .0713 45.000 .0983 67.500 .1011 .1169 90.000 112.500 .:498 135.000 . 1823 -.9000 157.500 . 1961 180.000

.0209

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DATE OS JUN 75 TABULATED DATA - SHIZF											PAG	£	27
		LARC UPWT	1115 (94-18	F).	SRB HITH	DUT 8. (	L. TRI	P		(RHA009)			
A-PHA ( 4) - 180.000	MACH ( 1, =	3.700	RN/L	•	1.517	HREF	•	.037	PO	- 3021.000	70	•	706.000
SECTION ( 1) SRB (FHD S	STINO HT)	DEPEND	ENT VARIABL	E H/	HREF								

SECTION	( 1) SRB (F	HO STIN	) HT)		DEPENDEN	IT VARIA	BLE H/HRE	F							
•	. 1220	. 1331	. 1441	. 1795	. 1905	.2016	. 3297	. 3407	.3519	.4203	.4313	.4424	.5303	.5413	.5524
THETA											0750	0775	. 0353	. 0370	. 0356
.000	. 0320	. 0311	.0216	.0337	. 0364	. 0350	.0317	.0313	00دَ0.	.0342	.0356	.0336	.0353	.0340	.0330
22.500								. 0336			.0380			.0382	
45.000		.0331			.0385			.0336			. 0300			. 0382	
67.500					90 10			. 0344			. 0344			.0367	
90.000		.0327			sc 10			.03**						.0374	
112.500		. 0304			. 0344			.0321			. 0344			. 0375	
135.000		. 0304			.05									.0369	
180.000	. 0290	. 0268	.0198	. 0295	.0325	.0312	.0300	.0300	. 6276	.0323	. 0340	. 0323	. 0340	. 0354	.03
X/L	.7251	. 7362	.7472	.7667	. דררר	. 8506	.8617	. 8727	. 9838	. 8948	. 9058	. 9266	.93 <sup>77</sup>	.9487	.97è.
THETA															.0674
.000	.0715	. 056 1	. 0534	. 0848	.0737	. 0676	.0763	. 0842	9´`J	.0886	.0725	. 0425	.0446	. 0602 . 0586	.0074
22.500	.0745									.0871		010		. 0594	. 0674
45.000	.0723		. 0495	. 0909						. 0890		. 04 18		.0569	.0074
€7.500	. 0731									. 0858		.0415		.0606	. 0690
90.000	9000		.0484	. 0821						.0863 .0851		.0413		.0598	. 5555
112.500	.0705									.0893		.0419		.0549	.0724
135.000	.0667		.0433	.0809						.0828		.0413		.0573	
157.500	. 0657				0020	.0717	.0785	.0945	.0918	0868	. 069 t	.0392	.9910	.0573	.0766
180.000	.0600	. 0474	.0411	.0725	.0678	.0/1/	.0765	.0045	.0310	5000					_

X/L .9812 THETA .000 .1004 22.500 .0905 45.000 .0986 67.500 .0992 90.000 .0970 112.500 .0968 135.€.0 .0969 157.500 -.9000 180.000 .0815

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DATE 08 JUN 75 TABULATED DATA - SHI2F PAGE 28

LARC UPHT 1115 'SM-12F), SRB WITHOUT B. L. TRIP (RHA010) ( 06 JUN 75 )

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	REFE	RENCE DA	TA				PARAMETRIC DATA									
SREF = 19 LREF = BREF = SCALE =	5836.8000 142.6000 142.0000 142.0000	INCHES INCHES	4.00	• ,	0000 INCH	€S				BE 1 MOD	A P	.000 3 000	RN/L	•	3.500	
ALPHA ( 1	1 - 140.0	000 M	ACH ( )	) • 3	3.700	RN/L	•	3.431	HREF =	. 057	PO	• 7010	. 300	10	718.000	
SECTION	( 1)\$ <b>89</b> ()	FHO STIN	9 MT)		DEPENDEN	IT VARIAE	BLE H/HF	REF								
X/L	. 1220	. 1331	. 1441	. 1795	. 1905	.2016	. 3297	. 3407	. 3518	.4203	.4313	.4424	.5303	.5413	. 5524	
THETA																
. 000	.0124	.0125	1600.	.0120	.0124	.0119	.0103	.0100	.0089	.0147	.0157	.0153	.0187	.0200	.0182	
22.500														.0159		
45.000		.0137			.0152			.0139			.0160			.0166 .0300		
67.500					. 0850			. 0996			. 0779			.0300		
90.000		.0710			. 0000			. 0000						. 1557		
112.500 135.000		.2320			. 2897			. 2844			. 2964			.2708		
157,500		. 5560						,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						. 3031		
180.000	. 3491	. 2990	.2122	. 3786	. 3985	. 3790	.4588	.4123	.3285	.4702	.4422	.4102	.4198	.4095	. 3671	
						~**	05.3	67. <b>2</b> .	0070	.8948	. 9058	.9266	.9377	.9487	.9726	
X/L	.7251	.7362	.7472	.7667	.רררר	. 8506	.8617	.8727	. 8638	. 8748	.9006	, 9200	.93//	. 5407	.9/60	
THETA																
.000	.0251	.0226	.0274	.0411	. 03A3	. 0360	.0414	.0423	9000	. 0393	.0349	.0299	. 0259	.0304	. 2930	
22.500	. 0259									.0302				. 0253		
45.000	.0250		. 0205	.0328						.0227		. 0220		.0226	. 27 <del>64</del>	
67.500	.0483									.0378				.0319		
90.000	.1171		.1083	. 1296						.0839		.0807		.0590	.2615	
112.500	. 2709									. 1540				. 1338		
135.000	.4363		.3111	.4856						. 2681		. 2 : 98		.2082	. 2548	
157.500	.5903									, 3357				.2803		
180.000	. 5660	. 5556	.5125	. 6894	. 5055	. 3998	.4116	.4048	.4267	,4194	.4201	. 3049	. 3006	. 3027	. 2537	
X/L	.9010															
THETA																
.000	.1117															
22.500	.0918															
45.000	.0909															
67.500	. 1048															
90.000	. 1378															
112.500	.2109															
135.000	.2925															
157.500	9000															
180.000	. 3428															

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DATE 06 J	UN 75		TABULATI	ED DATA	- SH12F									PAGE	88
	LARC UPHT 1115 (SH-12F), SRB MITHOUT B. L. TRIP (RHA010)														
ALPHA ( 2	1 - 150.	000 M	ACH ( 1	. 3	. 700	RN/L	• ;	3.402	HREF =	. 057	7 PO	- 698	1 . 800	TO -	720.000
SECTION	( 1) SR8 (	FND STIN	G MT)		DEPENDE	NT VARIA	BLE H/HRI	EF							
X/L	. 1220	. 1331	. 1441	. 1795	. 1905	.2016	. 3297	. 3407	. 3518	.4203	.4313	.4424	. 5303	.5413	. 5524
	******														
THETA									000	0260	0202	0361	0200	.0316	. 0302
.000	.0183	.0180	.0119	.0200	.0227	. 0232	.0237	. 0242	. 0224	. 0269	. 0282	.0261	.0299	.0240	. 0 300
22.500 45.000		.0165			. 0202			. 0200			. 0230			.0233	
67.500		.0103			.0202									.0284	
90.000		. 0637			.0892			.0693			. 0564			.0651	
112.500														. 1367	
135.000		. 1946			.2343			.2149			.2347			. 2235	
157.500														,3100	
180.000	. <i>2</i> 968	. 2456	. 1760	. 3084	. 3209	. 2952	. 3079	. 3069	. 2639	. 3425	. 3222	. 3146	. 3332	. 3202	. 3079
X/L	.7251	. 7362	. 7472	. 7667	,777 <b>7</b>	. 0506	.8617	. <b>8727</b>	.8938	. 8948	. 9058	. 9268	.9377	.9487	. 9726
THETA															
.000	.0366	.0299	. 0396	.0727	. 0651	. 0488	.0538	. 0589	9000	. 0638	. 0603	. 0459	. 0352	.0367	. 2643
23.500	.0432									. 0452				.0339	
45.000	.0418		. 0285	.0418						.0338		. 0264		.0259	. 2533
67.500	.0418									.0472				.0344	2205
90 000	. 0 <b>89</b> 6		.0711	. 0907						.0958		.0733		.0658	. 2205
112 500	, 1974									. 1587		. 1973		. l 101 . 1697	. 2042
135.000	. 3237		. 22 <del>85</del>	. 3331						. 2383 . 2690		. 19/3		. 2348	. 5076
157.500 180.000	,4288 .4096	. 3865	. 3589	.4798	.4066	.2782	. 2835	. 2 <b>85</b> 4	. 3027	. 3093	. 3331	. 2430	. 2434	.2572	. 1976
180.000		. 5003	, 5503	, , , , ,							,				
X/L	.9810														
THETA															
.000	. 1520														
22.500	. 1164														
45.000	. ! 129														
67.500	. 1238														
90.000	, 1568														
112.500	.2253														
135.000	. <b>2924</b> 9000														
157.500	.3911														
100.000	. 2211														

DATE DE JUN 75 FABULATED DATA - SHIZF PAGE 30

LARC UPHT 1115 (SH-12F), SRB HITHOUT B. L. TRIP (RHADIO)

THETA .000 .03 22.500 45.000 67.500 90.000 112.500 135.000 157.500 180.000 .16 X/L .72	380 (F)	. 0325 . 0325 . 0325	.1441 .1441	.1795	DEPENDER	.2016	3297	. <b>3</b> 407							
THETA .000 .03 22.500 45.000 67.500 90.000 112.500 135.000 157.500 180.000 .16 x/L .72		.0325			. 1905	.2016	.3297	7407							
.000 .03 22.500 45.000 67.500 90.000 112.500 135.000 157.500 180.000 .16	320		.0231	0767				,3407	.3518	4503	.4313	,4424	.5303	5413	. 5524
22.500 45.000 67.500 90.000 112.500 135.000 157.500 180.000 .16 X/L .72	320		.0231	0767											
45.000 67.500 90.000 112.500 135.000 157.500 180.000 .16 X/L .72		. 0262		.0303	.036J	. 0 <b>387</b>	.0365	. 0348	.0316	. 0384	.0411	.0398	. 04 <b>58</b>	.0479	, 0444
67.500 90.000 112.500 135.000 157.500 180.000 .16 X/L .72		. 0262												.0367	
90.000 112.500 135.000 157.500 180.000 .16					.0302			. 0275			. 0337			. 0353	
112.500 135.000 157.500 180.000 .16 X/L .72											01.4.6			,0714 ,0440	
135.000 157.500 180.000 .16 X/L .72		.0453			.0510			. 0485			.0448			.0966	
157.500 180.000 .16 X/L .72 TH€TA								. 1392			. 1461			.1400	
180.000 .16 X/L .72 TH€TA		. 1331			. 1575			. 1 392			, 1701			. 1853	
X/L .72 TH€TA	Lau	. 1687	. 1222	. 1949	.2089	.2047	. 1996	. 1917	. 1631	. 2030	. 1998	. 1933	. 1940	. 1966	. 1829
THETA	06 7	.1507													
	251	.7362	.7472	.7667	.7777	. 8506	.9617	.8727	. 0030	.8948	. 9058	. 9266	.9377	, 9487	.9726
	1647	.0512	. 0630	. 0920	. 0749	.0638	.0666	. 0694	9000	.0800	.0760	. 0529	.0431	. 0464	. 1811
	665									.0607				.0422	. 1692
-	595		.0417	. 0593						.0490		.0351		. 0367 . 0521	. 1096
	515									. 0535 . 0958		.0139		.0957	. 1521
	726		. 0620	.0879								.0139		.1100	.1961
	430									. 1319 . 1808		. 1135		.1211	. 1380
	999		. 1509	.2233						. 1968		. 1133		. 1350	
	483 349	2005	.2055	.2961	.2298	. 1939	.2031	.2088	.2271	. 2299	. 2109	. 1256	. 1207	.1407	. 1342
180.000 .23	349	. 2095	. 2000	.2001	.2630	. 1023	.6031	. 2000	.6671				. 1207	.,,,,,	,,,,,,,
(/L .98	810														
THETA															
.000 .12															
22.500 .09															
45.000 .10 <sup>4</sup> 67.500 .11 <sup>4</sup>															
67.500 .115 90.000 .146															
112.500 .20															
135.000 .26															
157.50090															
180.000 .30															

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A DO STAD	N 75		TABULAT	ED DATA	- SH12F									PAGE	31
				LAR	C UPHT 1	115 (5H-1	ef), sr	9 WITHO	JT B. L.	TRIP		1 RHA	010)		
ALPHA ( 4)	- 170.	000 M	ACH ( )	3	.700	RN/L	•	3.460	HREF =	. 57	PO	• 699	0.000	10 -	712.000
SECTION (	11588 (F	FHD STIN	O MTI		DEPENDE	NT VARIAB	LE H/HR	EF							
X/L	1550	1331	. 1441	. 1795	. 1905	.2016	. 3297	.3407	. 3518	.4203	.4313	,4424	.5303	.5413	.5524
THETA															
.000	. 0423	.0413	.0292	. 0475	.0501	. 0498	. 0482	.0465	. 3443	.0497	. 0503	. 0485	.0518	. 0523 . 0403	. 0492
22.500		4335			0766			. 0289			. 0307			.0387	
45.000		. 0325			. 0355			, 02 03			.0,0,			.0323	
67.500		. 0357			9000			.0315			.0288			.0315	
90.000 112.500		1000			5000						•			.0515	
135.000		0797			. 0874			.0735			. 0761			.0728	
157 500														. 0909	
180 000	1013	0559	.0704	.1049	1095	. 1077	. 0993	.0948	.0871	. 890	. 0961	.0961	. 0951	. 0932	. 0876
¥/L	.7251	7362	.7472	7667	777 <b>7</b>	. 8505	.8617	.8727	. 8838	,8948	. 9058	. 9266	. 9377	.9487	, 97 <i>2</i> 6
THETA															
00 <b>0</b>	0365	.070 t	0535	0747	. 0741	0530	. 0548	. 0567	9000	. 0589	.0674	. 0424	.0380	.0375	. 1120
22.500	.0886									. 0564				.0439	. 1013
45 C30	.0791		. 0434	. 0 /8 <b>6</b>						.0741 .092 <b>9</b>		. 0362		. 04 <b>83</b> . 0561	, 1913
67,500	. 0674									.1147		. 0670		.0774	. 0833
90.000	9200		. 04 35	. 0925						.1334		.0070		.0906	.0055
112.500	1048									. 1545		.0918		.0937	.0729
125.000	.!259		.0739	. 1471						.1508		. 03.0		. 1037	
157 500 180 000	. 1 <b>393</b> 1332	.1100	3874	. 1576	1353	. [115	. 1214	. 1307	. 1521	.1691	1730	. 0964	. 0922	. 1074	.0728
X/L	.9810														
THETA															
.000	.0905														
22.500	. 9878														
45.000	.1151														
67.500	. 1204														
90.000	. 1 384														
112.500	.1814														
135.000	.2205														
500 7د	9000														
180 000	PEES.														

STOOM OF THE TOO

DATE 06 JUN 75 TABULATED DATA - SHIRF

				LAR	IC UPWT 11	15 (SH-	12F), SA	8 WITHOU	JT 8. L. '	TRIP		(RHA)	10)		
ALPHA 1 5	- 180.6	000 H	ACH ( I	) - 3	3.700	RN/L	777	3.469	HREF -	. 057	PO	- 7009	9.000	10 -	713.000
SECTION	( 1) <b>SAO</b> (f	NO STING	MTI		DEPENDEN	T VARIA	BLE H/HR	EF							
X/L	. 1220	. 1331	. 1441	. 1795	. 1905	.2016	. 3297	. 3407	. 3518	.4203	.4313	,4424	.5303	.5413	.5524
THETA															a 0.0
.000	. 0460	. 0441	. 0305	.0479	. 0495	.0494	. 0452	. 04 32	.0416	. 0474	.0486	.0473	. 0519	. 0526 . 0487	. 0496
22.500 45.000		.0473			. 0528			.0472			. 0533			.0547	
67.500		.0473			.03.0			,,,,,						. 0548	
90.000		.0465			9000			. 6489			. 0463			. 0531	
112.500														. 0534	
135.000		. 04 38			. 0484			. 0457			.0491			. 0532 . 0543	
157.500				A. 12	01. EG	.0453	. 0439	. 0428	. 0399	.0474	. 0458	0480	. 0523		. 0496
180.000	.0413	. 0394	. 0293	. 04 32	. 0456	.0433	.0439	.0425	.0399	.0474	.0400	0400	.052.5	.0364	,0100
X/L	.7251	.7382	.7472	.7667	.7777	. 8506	.6617	. 8727	. 9838	. 8946	. 9056	. 9266	. 9377	. 9487	.9726
THETA															
. 000	. 0978	.0773	. 0696	.1173	.1067	.0805	.0880	. 0954	9000	. 1090	.0953	. 0486	. 0464		, 0 <b>999</b>
22.500	. 1037									. 1071				. 0573	
45.000	. 1005		. 0629	. 1296						.1104		.0478		. 0597 . 0572	.0919
67.500	. 1047									. 1081 . 1102		, 0494		. 0524	. 0802
90.000	9000		. 0608	.1164						.1111		יע דע ,		.0618	, 0000
112.500	. 1003 . 0976		. 0561	.1150						.1149		.0503		.0575	.0761
157.500	.0941		. 0.501	50						. 1059				. 0602	
180.000	.0956	. 0698	. 0524	.1012	.1012	. 0899	.0970	. 1029	. 1134	.1147	.1633	. 0484	.0480	. 0522	. 0734
X/L	.9810														
THETA															
. 000	. 0965														
22.500	. 0890														
45.000	.1010														
67.500	.1037														
90.000 112.500	. 1025 . 1064														
135.000	.1061														
157.500	9000														
180.000	.0938														